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Engineers of Independence

A Documentary History of the Army Engineers in the American Revolution, 1775-1783

Paul K. Walker

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THE COVER

The cover illustration by Frederick C. Yohn depicts activity typically performed by the Corps of Engineers and the companies of sappers and miners during the Revolutionary War. "Col. William Prescott at the Battle of Bunker Hill," Historical Paintings Collection, The Continental Insurance Companies

Engineers of Independence

A Documentary History of the Army Engineers in the American Revolution

1775—1783

by

Paul K. Walker

Historical Division
Office of Administrative Services
Office of the Chief of Engineers

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Foreword

The U.S. Army Corps of Engineers traces its origins to the earliest moments of our existence as a nation. Soon after assuming command of the Continental Army in July 1775, General George Washington acknowledged the critical shortage of officers with technical skills and made the first of several appeals for more engineers. He never obtained a sufficient number. But Army Engineers, their ranks filled largely with Frenchmen, erected fortifications from Boston to Charleston, mapped terrain for their commanders, laid out encampments, and cleared the way for the Army on the march. They experienced their finest hour at the siege of Yorktown in 1781. The Revolution clearly demonstrated the necessity for a trained corps of native American officers. That need was finally fulfilled with the establishment of the military academy at West Point more than twenty years later.

In *Engineers of Independence* Dr. Walker weaves together a colorful, concise narrative with original documents to tell the story of the beginnings of the Army Engineers. Many of the documents are reproduced here for the first time. The resulting account will appeal to general readers and scholars alike.

JKBratton

J. K. Bratton
Lieutenant General, USA
Chief of Engineers

The Author

Paul K. Walker obtained his Ph.D. degree in American history from the University of North Carolina, Chapel Hill. He is the author of *The Corps Responds: A History of the Susquehanna Engineer District and Tropical Storm Agnes* (1976) and "Business and Commerce in Baltimore on the Eve of Independence," *Maryland Historical Magazine* (1976). Before joining the staff of the Historical Division, Office of the Chief of Engineers, as a historian, Dr. Walker taught American history at several colleges in the Baltimore area.

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Preface

This collection of documents, including many previously unpublished, details the role of the Army engineers in the American Revolution. Lacking trained military engineers, the Americans relied heavily on foreign officers, mostly from France, for sorely needed technical assistance. Native Americans joined the foreign engineer officers to plan and carry out offensive and defensive operations, direct the erection of fortifications, map vital terrain, and lay out encampments. During the war Congress created the Corps of Engineers with three companies of engineer troops as well as a separate geographer's department to assist the engineers with mapping.

Both General George Washington and Maj. Gen. Louis Lebègue Duportail, his third and longest-serving Chief Engineer, recognized the disadvantages of relying on foreign powers to fill the Army's crucial need for engineers. America, they contended, must train its own engineers for the future. Accordingly, at the war's end, they suggested maintaining a peacetime engineering establishment and creating a military academy. However, Congress rejected the proposals, and the Corps of Engineers and its companies of sappers and miners mustered out of service. Eleven years passed before Congress authorized a new establishment, the Corps of Artillerists and Engineers.

In editing these documents I have retained the original spelling, grammar, and punctuation, with the following exceptions: I occasionally inserted or removed punctuation for easier reading, always capitalized the first letter after a period, and changed *&* to *and* and *&c.* to *etc.* Where feasible, when documents were available in both published and unpublished form, the original manuscripts were used. The glossary explains the many engineering terms used. Permission has been received to reproduce all material under copyright. Credit lines indicate the sources of documents and illustrations. Full citations are contained in the bibliography.

The contributions of many persons have enhanced this volume. The staff of the Historical Division, Office of the Chief of Engineers, gave invaluable assistance throughout. Lenore Fine first suggested the project and along with Jesse A. Remington provided continued encouragement. John T. Greenwood and Frank N. Schubert read and commented upon the entire manuscript. Agnes Riedel assisted with research, typing, and proofreading. Dorothe M. Grande advised on editorial matters. Dale Floyd offered helpful criticism. Alfred M. Beck, assisted by Margaret B. Combs, guided the manuscript through the final stages of production.

I am grateful to Don Higginbotham and Robert K. Wright, Jr., for their insights and constructive suggestions.

Billie Walker meticulously edited the manuscript and offered support and helpful criticism throughout the research and writing stages.

As author, I am solely responsible for interpretations and conclusions and for any errors of omission or commission.

Washington, D.C. Paul K. Walker

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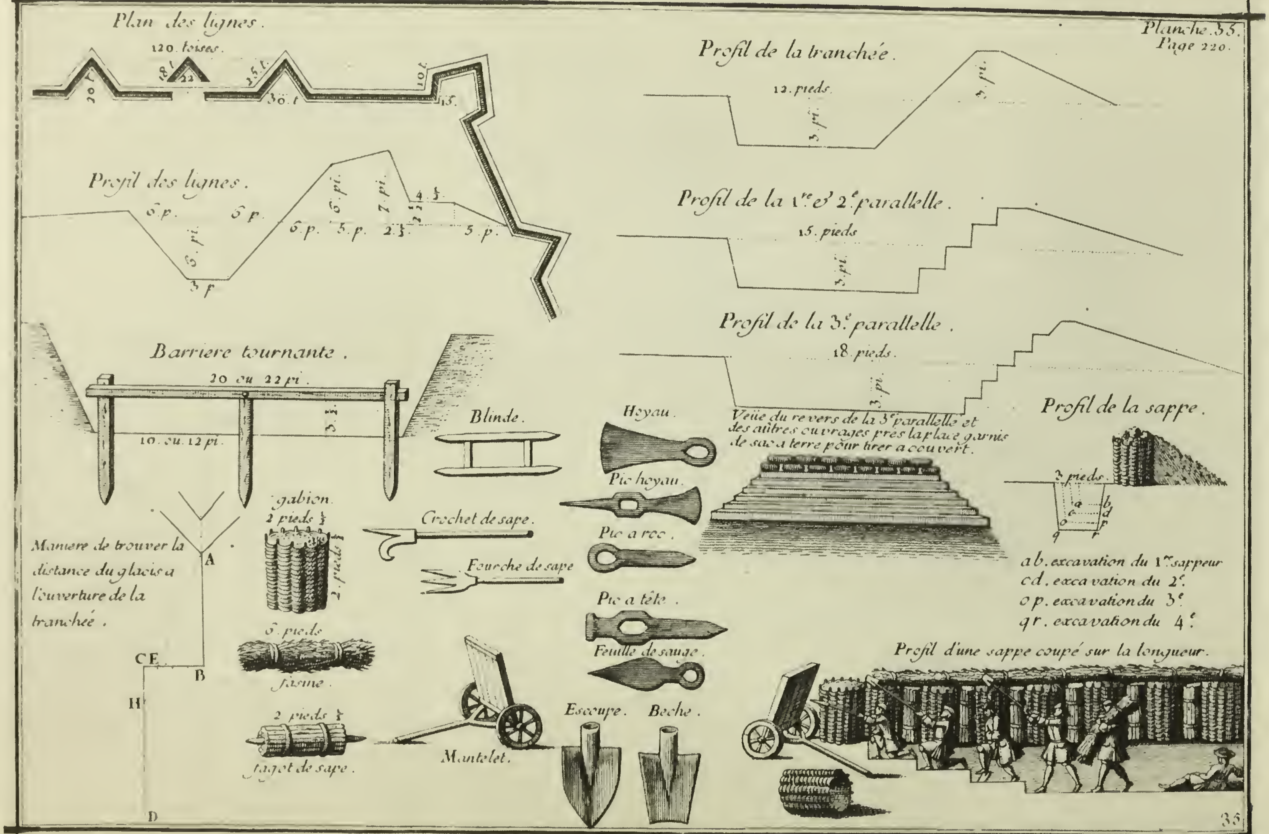


Chapter I

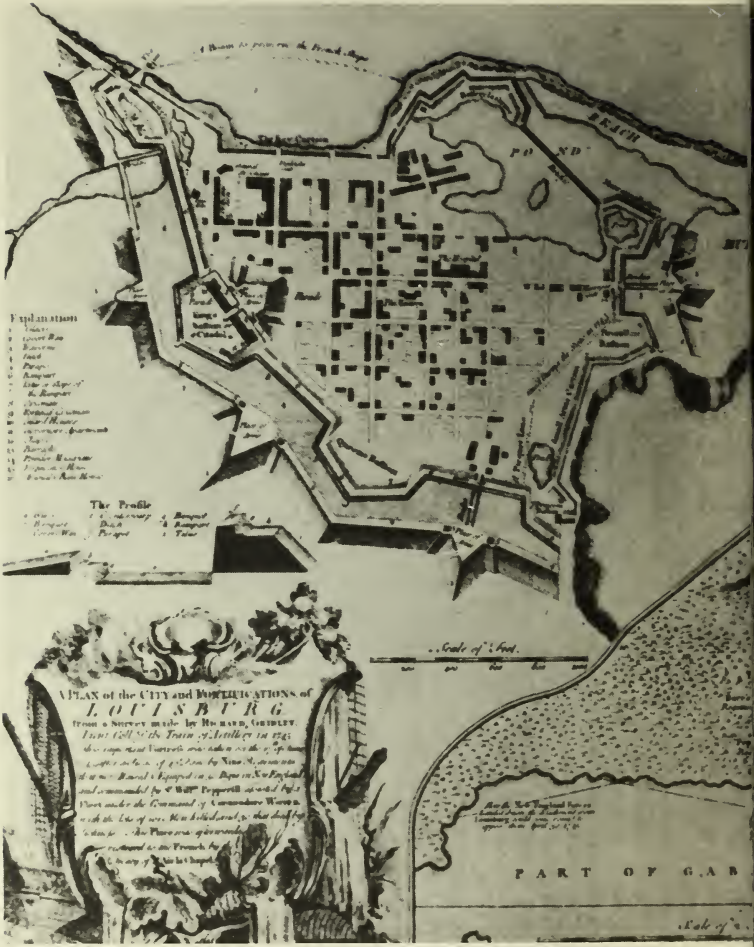
THE SEARCH FOR ENGINEER OFFICERS AND THE FORMATION OF THE GEOGRAPHER'S DEPARTMENT

When the American colonies went to war with Great Britain in April 1775, they had to do more than fight. They had to build an army. At first colonial militia units, acting independently, fought the British regulars; but on 14 June 1775 Congress established the Continental Army with General George Washington as Commander in Chief. On July 3 Washington assumed command in Cambridge, Massachusetts. His immediate concerns were to strengthen his fledgling army and confine the British to Boston. To enable his forces to check any British advances into the countryside, Washington quickly had to supplement existing earthworks with new ones.

From the start the predominantly defensive nature of the war convinced Washington he would need trained engineers, but he experienced continual frustration in his efforts to find them. "The Skill of those engineers we have . . . [is] very imperfect and confined to the mere manual exercise of cannon," he complained to the president of Congress, "whereas the war in which we are engaged, requires a Knowledge comprehending the Duties of the Field and Fortifications."[1] The shortage of qualified engineers was so acute because formal schooling in siegecraft, the erection of field fortifications, and technology was practically nonexistent in America. Officers with technical knowledge had gained it largely through their reading, and the few officers with engineering experience had acquired it while serving under British engineers in the colonial wars.

EIGHTEENTH-CENTURY FRENCH ENGINEERING MANUAL. *This page taken from Deidier's* Le Parfait Ingênieur Françąis *includes designs for parallel trenches and defensive lines, as well as sketches of engineer tools and a sap excavation,* bottom right. *Because no American training manuals existed, the Continental Army's engineers had to rely on English and French texts. American editions of Englishman John Muller's treatises on artillery and fortifications and an English translation of the Count de Clairac's* Field Engineer *appeared in the early part of the Revolution.*

Deidier, *Le Parfait Ingênieur Françąis*


A PLAN of the CITY and FORTIFICATIONS of
LOUISBURG
from a Survey made by Richard Gridley
Explanation
The Profile
BEACH
POND
Scale of feet
PART OF GAB

RICHARD GRIDLEY'S EARLY SERVICE AT LOUISBOURG. *This plan of the siege of Louisbourg, 1745, was made from sketches by Richard Gridley (1710–96), who thirty years later would become the American Army's first Chief Engineer. An artillery officer in the Massachusetts forces who had worked as a surveyor and had assisted a noted British military engineer in the Boston area, Captain Gridley joined the colony's expedition against Louisbourg in April 1745. As the designer of several batteries, Gridley played a major role in the successful American siege of the French-held fortress. In the years before the Revolution, Gridley continued to serve Massachusetts as an*

engineer and artillerist, notably during the French and Indian War. In 1763 the crown rewarded him with the Magdalen Islands in the gulf of St. Lawrence — an area abounding in seal and cod — and half-pay as an officer for life. In 1770 Gridley bought half-interest in an iron-rich pond near Sharon, Massachusetts. He soon opened a forge which later became a source of cannon and mortars for the fledgling Continental Army. When war broke out in 1775, his decision to side with the rebels cost him the Magdalen Islands and his life pension. No likeness of Gridley has been found.

Military Engineer, December 1947

Washington's first Chief Engineer was Col. Richard Gridley, a 65-year-old engineer and artillery veteran of the colonial wars, whom the Massachusetts Provincial Congress had named in April 1775 chief engineer, colonel of artillery, and major general of provincial troops. Gridley was the ranking engineer at the Battle of Bunker Hill, where he enlisted Capt. Jeduthan Baldwin, another colonial war veteran, as an assistant. Lt. Col. Rufus Putnam of the Massachusetts forces joined Gridley and Baldwin as an engineer when Brig. Gen. John Thomas, commander of the American right wing at Roxbury, needed assistance in erecting defenses.

Clearly Gridley had the most military experience, yet his knowledge was probably strongest in the field of artillery and limited in the area of fortifications—a situation that troubled Washington. On the other hand, Putnam, a millwright by vocation, felt himself lacking as an engineer, and was later to recall:

> I informed the General [Thomas] that I had never read a word on the Subject of Fortification, that it was true that I had ben Imployed on Some under British Eengeneers [*sic*] but pretended to no knowledge of Laying works. But there was no excuse would do, undertake I must.[2]

Putnam neglected to mention, however, that as deputy surveyor for the province of Florida in 1774 he had explored and mapped portions of the lower Mississippi.

For several reasons Washington was generally unenthusiastic about his first Chief Engineer. Gridley's age and a wound received at Bunker Hill kept him inactive throughout much of the summer and fall of 1775, a time when his advice and assistance were needed. In addition, until November 1775 Gridley commanded the Continental artillery, a role that diverted much of his attention from engineering. The fact that Washington had not personally chosen Gridley—he had assumed his position by virtue of his standing in the Massachusetts provincial forces—placed further distance between the Commander in Chief and his Chief Engineer. Gridley's rank of major general in the Massachusetts forces proved another thorn in Washington's side. Wishing to avoid alienating brigadier and major generals who thought Gridley's provincial rank too high to renew in the Continental Army, Washington recommended against a major general's commission for Gridley.[3]

In December 1775 Washington underscored his reluctant acceptance of Gridley as Chief Engineer. "We have no one here better Qualified, he has done very little hitherto in that department," Washington informed Congress. "But if the Congress chuse to appoint him, I will take care that he pays a proper attention to it."[4] Although Washington developed a strong preference for Putnam, Gridley continued as Chief Engineer until Washington moved to New York City in April 1776. Thereafter Gridley remained as chief engineer for the Army's Eastern Department, headquartered in Boston, and Putnam joined Washington's staff as Chief Engineer.

Even had Washington and Gridley worked together more effectively, the Commander in Chief's need for more engineers would have been scarcely less desperate. The engineering crunch affected the states as well as the Continental Army. As most states gradually became convinced of the danger of attack to their coastlines, rivers, and key port cities, where the majority of colonial Americans lived, they planned new fortifications or restoration of defenses that had languished since the end of the Seven Years' War in 1763. In some cases the states managed to get technical assistance outside the Army. Pennsylvania, for example, enlisted David Rittenhouse, a noted inventor, to work on the Delaware River defenses. South Carolina employed Ferdinand de Brahm, the nephew of a distinguished geographer.

There was so much work to be done that the states clamored for more engineers, apparently believing that Army engineers should be at their disposal. The Pennsylvania Committee of Safety, for example, wanted Washington to dispatch an engineer to plan and supervise the works it had authorized for Billingsport on the Delaware River. Rhode Island's Governor Nicholas Cooke wanted similar support at Newport. In both cases the Commander in Chief had to refuse: he had more than enough in New York to keep his few engineers busy. Actually Washington had to postpone completion of essential fortifications in the Hudson Highlands because of the shortage of Army engineers.[5] In June 1776, nearly a year after first taking command, Washington still lamented that he had "but one [Putnam] on whose Judgement . . . he would wish to depend in laying out any work of the least consequence." During that summer four volunteers received commissions as engineer officers, but still more were needed.[6]

Soon most states were required to accept the viewpoint of Maryland's Charles Carroll, Barrister. "We must . . . avail ourselves of the skill of such [engineers] as we can meet with among ourselves, though their Knowledge be not so perfect or complete," he advised the state's Council of Safety.[7] On the other hand, Virginia and South Carolina competed successfully with the Continental Army for engineers. As revealed in the following letter, the two states offered pay and travel allowances sufficient to win over from Maj. Gen. Charles Lee the only two engineers in his Southern Department. Despite Lee's badgering, it was a long time before Congress adequately settled the pay for Army engineers or acknowledged his arguments that engineer officers were required to travel more frequently than most other officers, usually alone, and hence were entitled to special benefits.

1. "IT WAS INDEED, IMPOSSIBLE FOR THEM TO EXIST"

Charles Lee to Richard Peters.

Charleston, August 2, 1776

I often represented to Congress how difficult or impossible it would be to engage, or retain after they were engaged, any engineers of tolerable qualification on the wretched pay established. The two appointed to my district have, as I expected, quitted the service. It was indeed, impossible for them to exist. [John] Stadler, I hear, has entered into the service of Virginia. [Baron] Massenbaugh is retained by this Province at fifty-four dollars per month, a servant, rations, and his travelling expenses. He formerly begged his dismission from me, assuring me, I believe sincerely, he was zealous in the cause of America; that he would willingly, if I chose it, enlist as a common soldier; but that to ride about the Continent from North to South, find horses, and appear like a gentleman, was impossible.

—Force, *American Archives*, 5th ser., 1:721.

As the hope of reconciliation with Britain faded in late 1775 and it became clearer that a protracted war was likely, the colonists began to look abroad for economic and technical assistance. On December 2 Congress directed its Committee of Correspondence "to use their endeavours to find out and engage in the service of the united colonies skilful engineers, not exceeding four," but no further action was taken that year.[8]

Finally in April 1776 Congress sent Silas Deane, an ambitious ex-congressman from Connecticut, to France as an agent. His instructions charged him with arranging the exchange of American goods for needed supplies; purchasing clothing, munitions, and artillery; and pursuing the possibility of an alliance with France. In addition Congress directed Deane to implement its earlier resolution regarding engineers. Deane's mission marked the first active recruiting by Congress of engineers across the Atlantic.

As Britain's most powerful enemy and the center of technical education in Europe, France was the most logical source of engineers for the Continental Army. The French engineer corps was a highly developed branch of the army with its own rigorous training program provided by the Ecole du Corps

SÉBASTIEN LE PRESTRE DE VAUBAN. *Most of the foreign engineers in the Continental Army had studied the principles of this master of military engineering at the great French engineering school at Mézières.*

Library of Congress

Royale du Génie, founded in 1749 at Mézières. This program combined theoretical instruction with practical exercise.[9]

At Mézières, the young officers still keenly felt the influence of Sébastien le Prestre de Vauban, the great seventeenth-century French engineer and master of siegecraft. Vauban's theories on the attack of fortified places emphasized that besieging forces could cut their losses by approaching fortresses systematically through a series of interconnected parallel trenches, and that additional protection in the form of temporary earthworks and other trenches was essential. The best defense was a defense in depth, substituting small-scale forts for the usual projecting outworks attached to the main enceinte.[10] Most of the French volunteers who eventually served as engineers in the Continental Army had been imbued with Vauban's doctrines at Mézières.

Deane's activities in France provoked immediate controversy at home. He was suspected of profiteering and was criticized for encouraging so many foreigners to come to America with promises of positions in the Continental Army. Literally besieged by volunteers, Deane often proved incapable of recognizing the best qualified officers among them.

Philippe Charles Tronson du Coudray,[11] a French artillerist and author of technical works on gunpowder, metallurgy, and artillery, was an exception. The artillerist combined proven expertise with access to valuable military stores. He was a competent, if somewhat headstrong, officer; and, as described by Deane, his manner and disposition were well suited to the antimonarchical American cause. That Coudray planned to bring "two hundred pieces of brass cannon, with every necessary article for twenty-five thousand men" clinched the argument in his favor.

2. "HE IS A PLAIN, MODEST, ACTIVE, SENSIBLE MAN, PERFECTLY AVERSE TO FRIPPERY AND PARADE"

Silas Deane to the Committee of Secret Correspondence.

August 15, 1776

. . . M. Coudray, the Engineer, . . . obtained liberty last week to go for America with as many Engineers as he should choose, and was not only assured of M. Beaumarchais[12] being able to procure the stores he had stipulated for, but received orders for them, and liberty to take two hundred pieces of brass cannon, lest part might be intercepted. M. Coudray has the character of the first Engineer in the Kingdom, and his manners and disposition will, I am confident, be highly pleasing to you, as he is a plain, modest, active, sensible man, perfectly averse to frippery and parade. My friends here rejoice at the acquisition; and considering the character of the man, and at whose hands I in effect received him, I must congratulate you on it. Several young gentlemen of fortune, whose families are nearly connected with the Court, are preparing to embark for America, by each of whom I shall, without disguise, write you the characters they sustain here. I have told them that merit is the sole object with the Congress. . . .

> . . . M. Coudray was not in the Turkish service as I was informed; it was a gentleman [Kermorvan] who proposes accompanying him; but he is an officer of the first eminence, an Adjutant-General in the French service, and his prospects here of rising are exceeding good; but he is dissatisfied with an idle life. His proposals in general have been, that he should be General of the Artillery, and subject only to the orders of Congress or their Committee of War, or of their Commander-in-Chief of the Army where he might be. In the next place, that he should rank as Major-General, and have the same wages, etc., coming in as youngest Major-General for the present, and rising of course.
>
> Many other particulars are not yet adjusted; but considering the importance of having two hundred pieces of brass cannon, with every necessary article for twenty-five thousand men, provided with an able and experienced General at the head of it, warranted by the Minister of this Court to be an able and faithful man, with a number of fine and spirited young officers in his train, and all without advancing one shilling, is too tempting an object for me to hesitate about, though I own there is a silence in my instructions. I therefore honestly declare I am at your mercy in this case, and I have no uneasiness of mind on the occasion; for should I be sacrificed, it will be in that cause to which I have devoted my life. . . . The terms of M. Coudray may be thought high; but consider a person having a certain and permanent service and leave his native country, to go he hardly knows where, and it must be supposed he will ask at least as good terms as he could have in his own country. . . .

—Force, *American Archives*, 5th ser., 1:1018, 1020–21.

Deane was right: volunteers like Coudray were venturing into the unknown by joining the Continental Army and they deserved ample rewards. But the certain alienation of native American officers as well as the volunteers' self-interested desire ultimately to advance their own rank in France were important factors that Deane ought to have weighed more carefully.

In September 1776 Deane concluded an agreement with Coudray. The terms were exceedingly generous and sure to evoke renewed controversy. The agreement gave Coudray the rank of major general and command of the artillery and the yet-to-be-formed corps of engineers. He was to receive a pension equal to half-pay; and when he traveled on duty the Congress was to supply him with horses and carriages, a benefit Washington and Lee had been seeking in vain for engineers already in service.

3. AGREEMENT BETWEEN DEANE AND COUDRAY FOR SERVICE IN THE CONTINENTAL ARMY

September 11, 1776

1. The Sieur Du Coudray, under title of General of Artillery and Ordnance, and in rank of Major-General in the Forces of the United Colonies, shall have the direction of whatever relates to the Artillery and Corps of Engineers, under the order and control only of the Congress of the United Colonies, their Committee of War, or the Commander-in-Chief for the time being.

2. The Corps of Artillery and Engineers, as well officers as soldiers composing the same, shall be under his immediate command, with all the privileges and authority annexed to such command respecting either rewards or punishments, and in case of vacancy in said corps by death, removal, or new creations, it shall be for him to recommend to the Congress, or their Committee of War, the persons proper for filling the same.

3. Whatever relates to the supplying the said corps with provision, to the construction of artillery and fortification, to any plan or scheme relative to these objects, will be consulted on with him, and the execution of whatever may be agreed on committed to him, as within his department.

4. His allowance for pay and table shall be the same as to a Major-General in the service of the United Colonies in a separate command. Should he be made a prisoner, the same shall be continued. Should he by accident of war in the said service be rendered incapable of serving, or should he choose after six years' service to retire, he shall be allowed an honourable annual stipend or reward by the Congress, the particular amount of which Mr. Deane refers to the honourable Congress.

5. Monsieur Du Coudray shall be furnished with an Adjutant, two Aids-de-Camp or one Aid-de-Camp, and a Secretary, and Designer, at the expense and in the pay of the United Colonies.

6. Monsieur Du Coudray's expenses, also those of his servants, in their voyage to America, shall be refunded him by the United Colonies. . . .

11. Considering the particular situation of Monsieur Du Coudray as a foreigner, and his uncommon exertions for and in behalf of the United Colonies, it is agreed, that his pension or annual stipend on his quitting the service, as afore-agreed, shall be the one-half of his pay and table whilst serving, or other equivalent gratification.

12. Horses and carriages will be supplied Monsieur Du Coudray, at the expense of the United Colonies, when he has occasion for removing from one part of the Continent to another; also to the officers proposing to go out with him, or advance to him such sum as will be sufficient to procure them in the Colonies where they are serving.

13. Considering the situation of the American war at this time, Mr. Deane thinks that two Engineers, four Captains, and four Lieutenants, with the proposed Adjutant-General will be as many as he can prudently agree for at present. . . .

—Force, *American Archives*, 5th ser., 2:284–85.

In early December 1776 Benjamin Franklin joined Deane in Paris to negotiate a treaty of alliance with the French. Upon his arrival Franklin reiterated Congress's call for engineers to King Louis XVI, who responded

BENJAMIN FRANKLIN AT THE COURT OF FRANCE. *Franklin spent almost nine years, 1776–85, in France, furthering the interests of America.*

Record Group 66, National Archives

by ordering the Comte de St. Germain, his minister of war, to recruit a group of Royal Engineers to serve in America. St. Germain turned to Louis Lebègue Duportail, an engineer officer whose work the previous summer on a new set of regulations for the Royal Engineers had earned him the war minister's acclaim.

Duportail offered his services to the American commissioners on condition that his grade in the Continental Army would be higher than the one he currently held in the French army. Then on 11 January 1777 he demanded command of all engineers in America. The next day Duportail laid down further stipulations: his pay was to begin on the day of his departure from France and his rank in America was to be higher than his new rank by brevet upon leaving France. Unlike Coudray, Duportail agreed to pay his own passage to America.

As a treaty of alliance had yet to be signed, the king ordered utmost secrecy surrounding the preparations to send French engineer officers to aid in the American Revolution. To accompany him to America Duportail chose three men of lesser rank in the Royal Engineers—Jean Baptiste de Gouvion, Jean Baptiste Joseph de Laumoy, and Louis de Shaix La Radière. By 17 February 1777 all four volunteers had signed contracts with the American commissioners.[13] Granted a two-year leave by the king, they sailed from Nantes under assumed names. The group landed initially at Santo Domingo; and from there, except for Laumoy, who was detained by illness, they made their way first to North Carolina and then to the seat of Congress at Philadelphia.

Meanwhile, under the terms of the Deane-Coudray agreement, several French officers signed up as members of Coudray's staff. They began arriving in America in March and April 1777. Because Coudray's actions jeopardized the secrecy of French aid, the French government ordered him to renounce his commission and stay home. He ignored the order, stole out of the country, and finally reached America in May. Additional officers hoping to join the Coudray group crossed the Atlantic of their own accord.

The need for engineers remained acute, particularly in the south, where Charles Lee complained with characteristic hyperbole: "There is not a man or officer in the Army, that knows the difference betwixt a Chevaux de Frise, and a Cabbage Garden."[14] However, the price of attracting engineers threatened to wreck the chances of obtaining any more. Most members of Congress and Army officers were revolted to find foreigners granted commissions that in many cases placed the newcomers above Americans already in service. When Coudray presented himself in Philadelphia, his reception was chilly. In the eyes of Congress Deane had gone too far.

Washington recognized the problem too and suggested restraint in making promotions, except in the case of artillerists and engineers. Engineers, wrote the Commander in Chief, "are absolutely necessary and, not to be had here, but proper precaution must be observed in the choice of them."[15]

Washington declared further that he had two engineers (not named) "who. in my judgment know nothing of the duty of Engineers. Gentlemen of this profession ought to produce sufficient and authentic testimonials of their skill and knowledge, and not expect that a pompous narrative of their Services and loss of papers (the usual excuse) can be a proper introduction into our Army."[16]

In July 1777 tensions mounted. On the 5th Duportail and his companions presented their credentials to Congress. The Royal Engineers grumbled that Coudray had "duped Deane" and "made a . . . bargain for himself, and all the officers with him."[17] At the same time Major Generals John Sullivan, Nathaniel Greene, and Henry Knox threatened to resign because Coudray the newcomer would outrank them.

Still more volunteers, led by the Marquis de Lafayette, a wealthy nobleman inspired by the American cause, also arrived in Philadelphia in July. They too had promises from Deane. Congress was in a quandary. The various groups of French volunteers had besieged James Lovell, a French-speaking member of Congress's Committee on Foreign Applications, for assistance. Much to his displeasure, several of the French officers made him their interpreter and liaison with Congress. Lovell admitted to fellow congressman William Whipple, the "contending endless talkers and writers have entirely destroyed me," and noted, "there is as much pulling and hauling about rank and pay, as if we had been accustomed to a military establishment here 150 years."[18] Yet Lovell took up Duportail's cause.

Lovell's support for Duportail was based on his conviction that the four Royal Engineers were "the only officers . . . procured by the *real* political Agents of Congress." The congressman further argued that the four "legitimate" engineers were being grossly underpaid and that the nature of their profession demanded that horses be made available to them. Significantly, Lovell opposed utilizing "military strangers" except in the case of engineers and one or two officers to serve as instructors-at-large for the Army. Once again the critical shortage of engineers and the desperate need for their technical services combined to overcome American uneasiness about enlisting foreigners.

4. "THERE IS SINGULAR HARDSHIP IN THE CASE OF THESE GENTLEMEN"

James Lovell to George Washington.

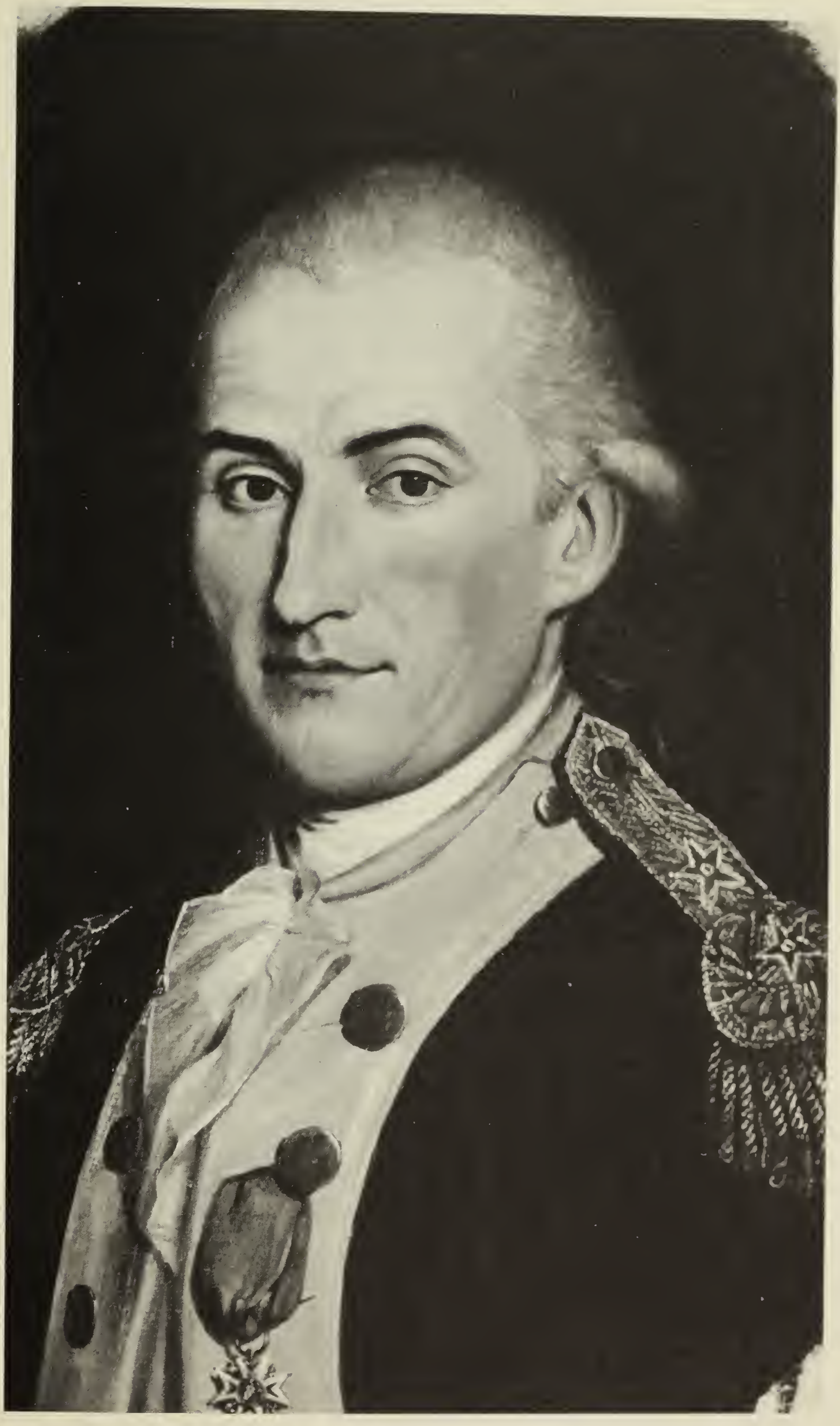
Philadelphia, July 24th [1777]

Sir

. . . The Corps of Engineers is very honorable in France; and officers from it are sought by different european Powers. These Gentlemen who are come over into our service made an agreement with our Commissioners to rise one degree from the rank they held at home, upon a supposition that the practice of Europe had been regarded here. But when they arrived, they found instances very different wth. respect to officers in all other corps. It was their mishap also to see a Major of Artillery [Coudray] affecting to be exalted four ranks, as a Chief in his proper line and theirs also. They made a representation of these circumstances and appealed to the Equity of Congress. But, they had arrived at a time when the Infatuation of some here and the wild conduct of one abroad [Deane] had rendered a Spirit of reformation absolutely necessary as to the point of rank. The ingenuous, however, must own that there is singular hardship in the case of these Gentlemen. The only officers ever sent for by us, procured by the *real* political Agents of Congress, coming out with the good wishes of the french Ministry, being of undoubted rank and ability in their Profession, find themselves in the Dilemma of becoming the first examples of our new reforming Spirit, or else of going home during a Campaign, which their high sense of honor will not allow. . . . Mr. Du C[oudray] having created himself to the Command of Artillery *and* Engineers, persuaded Mr. Deane that it would be impossible to get any from the *military* corps of Engineers now called *royal* because their Demands would be so exorbitant; and that it would be also unnecessary, because we ought not to build fortified Places in America to serve as secure Holds to our Enemy when once taken from us; and that therefore, a few *Bridge and Causeway-makers* would answer all the ends of military Engineers. Such he brought with him; who were quite ready to fall under the command of an *artillery* direction; when not the lowest officer of the royal corps of Engineers would have submitted to such a novel pretension. . . . Mr. Du C[oudray] has given full scope to *his* species of Ingenuity, here [before Congress], as in

LOUIS LEBÈGUE DUPORTAIL. *Charles Willson Peale painted this portrait of Duportail (1743–1802), who served as Chief Engineer in the Continental Army during 1777–83. Born to a noble family in Pithiviers, France, Duportail attended the French school of military engineering at Mézières and was a Royal Engineer when he volunteered for the American Revolution. He served with distinction during the Philadelphia campaign and at West Point, frequently helping Washington coordinate plans with officers commanding the French forces in America. Captured at Charleston in 1780, Duportail was exchanged in time to command the engineers at the Battle of Yorktown. He returned to France in 1783 to become a brigadier general of infantry and later secretary of war. His support for Lafayette during the French Revolution forced him into hiding. To escape the Reign of Terror, Duportail fled to America and as an émigré settled on a farm near Valley Forge. Heeding Napoleon's order that émigré officers return home, Duportail sailed for France in 1802. His ship was lost at sea.*

Independence National Historical Park Collection



the Neighbourhood of Mr. Deane. I have been told that he has said, if he could not be employed himself, he would bring it about that these others should not. This may be an absolute Falsehood. But, I will own it comes the nearest of anything, which I can conceive of, to explain the delays which have taken place in regard to these Engineers, who ought to have been sent to your Excellency long ago. They have remained subject to the crucifying expences of this city, because their employment seemed to interfere wth. Mr. Du Coudray's Pretensions, tho' those very Pretensions had been rejected. Your Excellency would doubtless smile, if you should ever hear, that even a number of *Peasants* disputed 3 days about the difference between the consequences of a man's being Colonel in Chief, or First Colonel, or Colonel to take rank and Command of all heretofore appointed, or Colonel *commandant* of Engineers. Would not a Brigadier or Major General of Engineers alike annul the supremacy of the differently worded commissions? Or rather, do not the 4 different modes give like command? I shall pass from rank to pay. These Gentlemen not only far from the prophesied exorbitancy in demand of rank, never received one shilling in France as Gratification; tho' others who were *not sent for* received large sums, and claim pay from their embarkation, and even pensions for life. But Doctr. Franklin, supposing it would be less trouble to himself and more agreeable to the Engineers to see to their own passages, stipulated their pay from the 13th. of Febry. As no Regulations have yet been made in regard to Cavalry or Engineers, these Gentlemen have received 5 months pay as Infantry; which will not refund the expenses of their voyage. I am really uneasy when I find manly honourable Intentions do not meet with at least equal emoluments with artful suspicious tricking contractors. If these officers do not walk to camp, it is not because they were furnished by the Board of war with horses upon my application for them: And yet the nature of their Profession demands a provision of this Kind. Are they suddenly to reconnoitre a Camp, a River, a shoar, or a whole neighbouring country thro' which an army is to march, and to make the speediest return to the Generals, on foot? I trust your Excellency when asking for Engineers had ideas of something beyond what the sinister views of an ambitious foreigner has sought to inspire us with here; which is forming a causeway, or cutting a ditch or planking a bridge. And I shall consequently rest satisfied that you will receive the Officers now presenting themselves to you, and secure to them such honors and emoluments as you shall find them to merit from their education and abilities *exemplified under your command.*

No one has been more backward than I in desiring to see foreigners in our service, to the slight of my countrymen. And, except Engineers, I could not admit the thought of our wanting any military strangers other than one or two veteran Adjutants or Majors, who know our language well, and could serve as instructors-at-large to our spirited and well-attached young american Officers.

I wish these Engineers could speak english better than they do; but they can receive orders and give them in english, and will speedily learn to speak. . . .

—Burnett, *Letters of Members of Congress*, 2:417–20.

On 29 July 1777, when Duportail, Radière, and Gouvion reported to Washington's headquarters near Philadelphia, they found Coudray already at work on defenses in the vicinity. Sensing the friction between Coudray and Duportail, Washington sent the latter back to Philadelphia. He confided to Maj. Gen. Horatio Gates, the commander at Philadelphia, "I perceive there is a Jealousy between them [Duportail and Coudray] and setting them to work together would only create confusion and widen the Breach."[19]

Throughout the summer of 1777 Duportail continued to press for acceptance of Lovell's argument: the Royal Engineers were the only engineers legitimately authorized by Congress. Even though Congress on July 22 attempted to soothe Duportail by voting him seniority and command over all previously appointed engineers, controversy continued to surround Coudray. On August 11 Congress appointed a special committee to define Coudray's powers, for the time being depriving him of his command duties and naming him to the innocuous post of "Inspector General of Ordnance and Military Manufactories."

The Coudray problem aggravated the inherently difficult engineering situation until mid-September, when Coudray's nervous horse jumped from a pontoon bridge into the Schuylkill River. Coudray drowned.[20]

Coudray's death made Duportail's position secure. Yet in the fall of 1777 the Royal Engineers nearly decided to return home because they felt mistreated. They were particularly disturbed about matters of pay, perquisites, and rank. Having used promises of rank and pay to attract foreign volunteers, particularly engineers, the rebels were now not fulfilling their pledges. Although the patriots could ill afford to lose Duportail's services, a number of times during the war they came perilously close to doing just that.

By November Congress had still not paid the French engineers and Washington was loaning them horses and servants. As demonstrated in the following two documents, Duportail's response to this situation was prompted by a genuine feeling of humiliation and real need. In seeking a settlement of pay and perquisites, he argued that engineers deserved more pay as their duty in comparison to other officers "is much more laborious and painful." Moreover, because engineers were frequently away from camp and thereby facing higher living expenses, they deserved special compensation. Horses and servants were added necessities.

Although he commanded all engineers, Duportail found the rank of colonel intolerable. He no longer accepted Congress's argument that his promotion and those of his companions were being delayed to discourage claims by other foreigners seeking advancement. In Duportail's view the Chief Engineer should have been at least a brigadier general to earn respect for his opinions among the generals he frequently advised and to gain compliance with his commands. Moreover, Duportail contended, higher rank would silence the personal insults leveled by those "who do not love the french."

5. "I HAVE HERE REQUESTED NOTHING BUT WHAT IS ABSOLUTELY NECESSARY FOR OUR SERVICE"

Memorial of Louis Duportail to Congress.

Fall 1777

I beg to lay before the honourable congress the following requisitions to be by them determined or to authorize his excellency general washington to Settle them according the knowledge he has of our Service.

1. To Know what pay is allowed to our rank, I would observe that the pay of engineers in europe is much higher than any of the other officers, it is, that the duty of an engineer is much more laborious and painful, in time of war their pay is raised Because in actual Service their expenses are much increased, they are obliged to be continually out to acquire a Knowledge of the country, therefore cannot live So cheap as in camp.
2. To fix the number of horses, a lieutenant engineer in france have tow [two] horses, I hope it will not Be thought unreasonable when I ask tow for a lieutenant colonel and tow for a major, I ask three for me Because it is necessary that I Be always near the general [Washington].
3. To fix the rations of forage according the number of horses, when to our rations the number fixed for your officer in the artillery in the Same rank as our Seems to me Sufficient.
4. As it is impossible to find here Servants, I hope that his excellency general washington may be allowed to appoint us out of the troops.
5. There are Several Small expences attending our Service, for an instance the labourers we are obliged to employ, proper, colours, are to Be considered, it is our custom to make this a Separate account. Signed By the engineer who has employed those things. And after By me, and Soon after By his excellency the general washington.

I beg the honourable congress to observe that I have here requested nothing but what is absolutely necessary for our Service, as we must join the army as Soon as possible I hope for an Speedy answer, and if the requisitions accepted, that we may Be allowed our pay to commence the 13th of february as has Been fixed; if the honourable congress authorized his excellency general washington to settle this Business, I ask to the honourable congress to let me have 200 dollars, and 150 to mr. de la radiere and the same to m de Gouvion. We want absolutely that monney to be provided with every thing for the campain; for our purses have Been empty in our passage from france, and what we have received is very far from that we have expended. . . .

—**Papers of the Continental Congress, roll 51.**

6. "THE CHIEF ENGINEER SHOULD HAVE A RESPECTABLE RANK IN THE ARMY"

Louis Duportail to the President of Congress.

November 13, 1777

Sir:

When we [the Royal Engineers] entered the Service of the united States, we publicly declared to the honorable Congress that we would Serve during this campaign only in the Stations of colonel, lieutenant-colonel and major. . . . The congress found our reasons well grounded; but wished that we might, for the present, remain satisfied with our commissions, to give an example and in order to Stop the pretensions and Claims of the french officers and other foreigners. We were told that it was intended that the different grades Should be considered and regarded as on a level with the commissions in the european armies; and to accustom to consider them in the Same light, but in the mean time we were promised that we Should not [be] left long with the commissions we then accepted and that the congress only wanted to have an opportunity of Saying that a lt colonel in the royal corps of french Engineers had been Satisfied in this army with the rank of colonel, a major in Said corps with the rank of lt. Colonel, a Captain with that of a major.

As this Scheme of government Seeme'd to us very sound and Judicious, and that we wished from the very beginning to be useful we consented to Serve with our present commissions, but as we are to pay a proper attention to our rank and to the corps we belong to in france, as it must not be Said against us, that, when the french Engineers are usually preferred in foreign Courts we have been here worse use'd than the other french officers, we declared to the honorable Congress, that we would Serve during this campaign only, with our actual rank.

Now as the campaign is drawing to its end, and Supposing that, contrary to our wishes, we Should be induce'd to leave this continent, as we have hardly time enough left to reach france towards next January (which is the time appointed for appearing at our corps if we do not continue the Service here) I have the honour to present your Excellency with the present petition, Demanding for me the rank of Brigadier-general, for Mr. de la Radiere of colonel, for Mr. de Gouvion the rank of lt. Colonel.

Intreating your Excellency to convey our demand to the honorable congress. I could undouted apply directly to congress Since i ask only the accomplishing of the promises made to me; but i own that the ranks we call for would flatter us infinitely more if they were granted to us by the recommendation of your Excellency. The motives i have already mentioned only concern our Selves. But i could add Several relating to the Service. In all the european armies the Chief Engineer is almost always a general officer, because as he is to take orders from the commander in Chief only it is fit he Should himself be a general officer. More over the Chief Engineer who has a most essential department Should have a certain weight and be regarded in the army, as he is continually in the Case of consulting general officers he ought to be upon an equal footing with them, or else being oblig'd to Submit to their opinion or Shy of defending his own, his Zeal Cools by degrees; he withdraws, and Soon becomes an useless member in the army.

The execution of the different works requires that the chief Engineer Should have a respectable rank in the army, I must add that it is more necessary in this country than elsewhere. Have i not Seen the colonels of the army and even the militia colonels refusing to follow my directions about the works. They have been accustomed to Say that they are colonels as much as I and had no orders to receive from me; accordingly each of them worked as he thought proper.

I cannot express all the difficulty i met with, and i can Say that i had need of the largest, Stock of patience and Zeal to be kept from abbandoning them entirely.

As it is not just that we Should lead a more disagreeable life than the last officer of the army, i will beg leave from his Excellency to add a few reasons more. The rank of colonel unless with the command of a regiment is very little respected, because it is given to a vast many people who are not in the military line. We Suffer very much from this defect in the establishment and indeed very little regard is paid us in the army. If we take up quarters we have to contend for them; the Soldiers even offer to take them from us and we have often been forced to drive them out. If we pass before the line, the Soldiers who do not love the french and even some ill-bred officers give us bad language, our Servants are insulted, our Wagoners are chased from every place, and when they mention the names and ranks of their masters, they are laught at; thus on public Service and in private life we meet with anxieties and mortifications which we can bear no longer. The rank of general officer which i call for will immediately put a Stop to those inconveniences, as it is respected here it will give our corps the becoming weight and regard So as to make us take a liking to our functions and to give us the means to fulfill them in the most useful manner for the Service of the united States.

—Papers of the Continental Congress, roll 51.

Congress accepted Duportail's immediate arguments pertaining to rank, making him a brigadier general on 17 November 1777. But the issues of pay and perquisites and that of command relationships among all of the Army's engineers were not resolved to his satisfaction for some time.

In considering the Royal Engineers superior to all other engineers in America, whom he viewed as "engineers only by name," Duportail identified a key problem that troubled Washington as well. Whatever his discontents, Duportail would serve as Chief Engineer for the duration of the war.

7. "WE BELIEVED THAT THE CONGRESS WOULD BE SENSIBLE"

Louis Duportail to the President of Congress.

Camp White plaines, 27th August 1778

Sir:

His Excellency Gen. Washington intending to establish in the Department of which I have the honour to be Chief, proper Order and Connection, I must give you notice of a Matter that is only for the Congress to determine.

When we first Came into the Country (I mean the few french Engineers sent by the Court) we inquired if there were in the American Army any Engineers, either born in the Country or Strangers, who had practised already in that Profession and thought able to do that duty. We learned that there were not—that all the Gent. who had the title of Engineers had received it for the first time of the Congress—and they were beholden for it to the necessity the Congress were under, at the time they were appointed, of giving Commissions in that department to the first gentlemen that offered their Service.

We then conceived it against Reason and the advantage of your Service, that we Should be exposed to follow the directions of those new Engineers; we believed that the Congress would be Sensible, that it would be unjust and contradictory to ask the Court of france for Engineers and to place them in their Art under Persons who are Engineers only by name, that to do so would abase our abilities on a level with theirs, and therefore hinder our being more useful than they. Thus we required of the Congress that not any of us Should be ever commanded by them. The Congress found our request just and reasonable. They made a resolve by wich I was to command all the Engineers employed in the United States, whatever might be their Commission. The Same was expressed in my Brevet. As for the three other french Engineers, it was said to us that their Commissions were Constructed So, that they had a right to command the other Engineers who had not Similar commissions. The difference was that our gentlemen were Called Col, Lt Col or major *of the* Engineers whereas the others were called only Col. Lt. Col. or major Engineer. Thus it was understood likely, that they were in the Same Case of any officer, whatever, either of foot or Horse, that has a commission of Col. or Lt Col. and is not yet Col. or Lt Col. of the Reg[imen]t—his Commission do not hinder him being under the command of the Col. or Lt Col. of the Regt even of the major. Yet Some time ago there happened some difficulty about it—A Col. Engineer, would not acknowledge Mr. de la Radiere, Col. of the Engineers, for his Superior. It is a matter of importance, Sir, that these things Should be determined, and I beg you do your endeavors to have them as Soon as possible . . . .

—Papers of the Continental Congress, roll 51.

Though most of the Coudray group ultimately returned to France, Congress happily commissioned three of his associates as engineer officers.[21] In addition, three other Frenchmen received engineer commissions during the first six months of 1778.[22] Congress issued the last engineer commission to a foreigner on 2 March 1780.[23] Despite the influx of foreign volunteers, the Army never had as many engineers as it needed.

Washington's compelling need for technical assistance also forced him to seek creation of a separate geographer's department to supplement the work of the engineers. Reconnaissance of potential battle sites, camps, areas of troop movement, and enemy positions was vital. "The want of accurate maps of the country which has hitherto been the scene of war," Washington complained early in 1777, "has been of great disadvantage to me." While the British had a plethora of well-executed maps, inadequate facilities made extremely difficult the duplication of what maps Washington's overworked engineers could produce. To remedy the problem he proposed that the Army employ men specifically to map "Roads, Rivers, Bridges, and Fords over them, the mountains and the passes through them."[24]

As usual Washington had to badger Congress to act on his request for Army cartographers. Finally in mid-July 1777, he proposed the appointment of "a good Geographer to Survey the Roads and take Sketches of the Country where the army is to Act," and suggested placing the geographer in charge of the guides, "who must have a head to procure, govern, and pay them."[25] For the Army's first geographer Washington nominated Robert Erskine, a "thoroughly skilled" man who had already assisted the Army as a mapmaker and who before the war had developed a steam pump, worked on a centrifugal hydraulic engine, written on rivers and tides, and been accepted into the Royal Society of London.

Erskine readily agreed to the appointment as "geographer and surveyor of the roads." As revealed in his letter of consent, Erskine possessed a keen sense of the problems inherent in surveying and mapping. He carefully outlined the needs and capabilities of his department so "that more may not be expected than it is practicable to perform." As assistants he preferred "young gentlemen of Mathematical genius, who are acquainted with the principles of Geometry, and who have a taste for drawing." The new geographer was both eager to begin work and highly qualified.

8. ERSKINE OUTLINES "WHAT MAY REALLY BE ACCOMPLISHED BY A GEOGRAPHER"

Robert Erskine to George Washington.

Ringwood, August 1, 1777

May it please Your Excellency:

. . . It is then perhaps proper to begin with a general view of the nature of the business in order to shew what may really be accomplished by a Geographer, that more may not be expected than it is practicable to perform; and that an estimate may be made of the number of assistants required should the Map of any particular district be required in a given time. It is obvious that in planning a country a great part of the ground must be walked over, particularly the banks of Rivers and Roads; as much of which may be traced and laid down in three hours as could be walked over in one; or in other words a Surveyor who can walk 15 miles a day may plan 5 miles; if the country is open, and stations of considerable length can be obtained, then perhaps greater dispatch can be made; very little more, however, in general can be expected; if it is considered that the Surveyor, besides attending to the course and measuring the distance of the way he is traversing, should at all convenient places where he can see around him, take observations and angles to Mountains, hills, steeples, houses and other objects which present themselves, in order to fix their site; to correct his work; and to facilitate its being connected with other Surveys. A Surveyor might go to work with two Chain-bearers and himself; but in this case he must carry his own instruments, and some of them must frequently traverse the ground three times over at least; therefore, to prevent this inconvenience and delay, as men enough can be had from Camp without additional expense, six attendants to each surveyor will be proper; to wit, two Chain-bearers, one to carry the Instrument, and three to hold flag staffs; two flags, indeed, are only wanted in common; but three are necessary for running a straight line with dispatch; and the third flag may be usefully employed in several cases besides. From what one Surveyor can do, it will therefore appear that in making a plan, like all other business, the more hands are employed in it, the sooner it may be accomplished; likewise, that the director of the Surveyors will have full employment in making general observations, and connecting the different surveys as they come in, upon one general Map; and, at any rate, that a correct plan must be a work of time.

A great deal however may be done towards the formation of an useful Map, by having some general outlines justly laid down; and the situation of some remarkable places accurately ascertained; from such data, other places may be pointed out, by information and computed distances; in such a manner as to give a tolerable idea of the Country; especially with the assistance of all the maps in being, which can be procured: and this, perhaps, is as much as can be expected, should plans be required to keep pace with the transitions of War.

Navigable Rivers, and those which cannot be easily forded, and likewise the capital roads, should be laid down with all the accuracy possible; but, in the Map of a country, the general course of fordable rivers need only be attended to; it not being practicable to express small windings but on large scale, the same accuracy not being required here which is necessary to ascertain the quantity and boundaries of private property. In general, therefore, the adjacence to, and intersection of, such rivers with roads, will determine their course with sufficient exactness: the situation of woods and mountains, too, may be remarked in a similar manner.

Young gentlemen of Mathematical genius, who are acquainted with the principles of Geometry, and who have a taste for drawing, would be the most proper assistants for a Geographer. Such, in a few days practice, may be made expert surveyors. The instrument best adapted for accuracy and dispatch is the Plain-Table; by this, the Surveyor plans as he proceeds, and—not having his work to protract in the evening—may attend the longer to it in the day. One of these instruments, with a chain and ten iron-shod arrows, should be provided for each of the Surveyors it may be thought proper to employ. . . .

—Heusser, *Washington's Map Maker,* pp. 163–65.

Although regulations for the geographer's department were never formally established, Erskine's pay was set at $4 and four rations per day. In accepting that amount Erskine made it known that geographers in Britain received one guinea, or approximately $5, per day plus expenses; but he conceded that at that rate his pay would exceed that of a major general![26] The assistants—who numbered from two to six—received $2 per day and one ration, and the chain bearers 50 cents per day. Each member of the department was granted an allowance for travel and for purchasing instruments and other essentials.

Dissatisfaction with their pay led two of Erskine's assistants in 1780 to place before him the following urgent appeal. Especially at issue was the surveyors' contention that they had been bypassed when other departments of the Army received pay increments. Despite support for increased pay from both Erskine—who emphasized his department's contributions to the war effort—and Washington, Congress rejected the surveyors' request. As a result it became difficult to recruit surveyors.[27]

9. "WE ARE FAR FROM WISHING TO RAISE FORTUNES BY THE CALAMITIES OF OUR COUNTRY"

Simeon DeWitt and Benjamin Lodge to Robert Erskine.

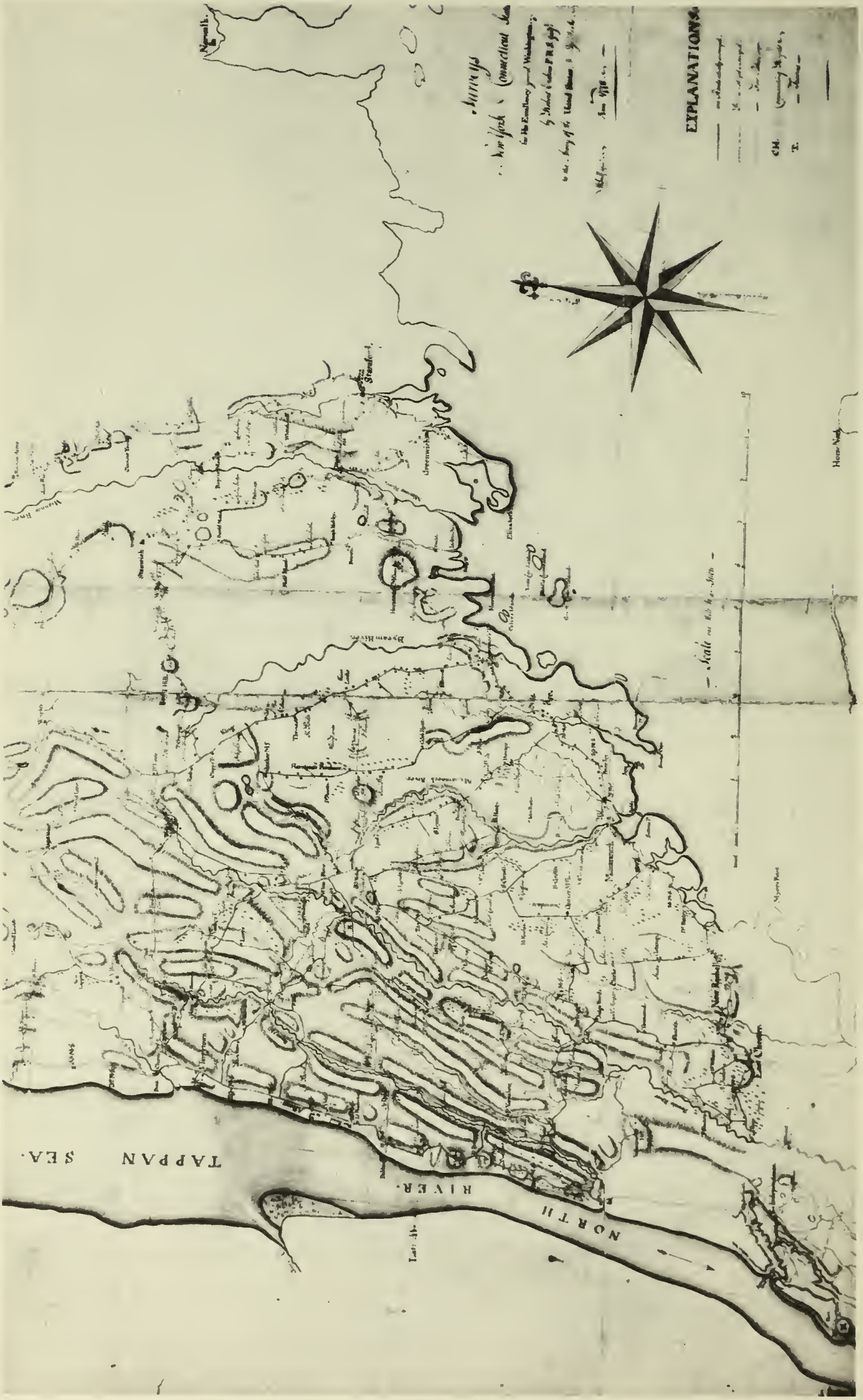
Morristown, February 12th, 1780

Dear Sir:

As the Directors of our affairs undoubtedly wish to do justice between the Public and its servants, we beg leave to request the favor of you, when arrived at Philadelphia, to represent the difficulties under which the Surveying Department labors at present, which, we flatter ourselves, only requires to be known to be redressed.

Formerly common Surveyors, whose acquaintance with the business was limited by the Needle and Protractor, were paid at least fifteen shillings per day, exclusive of their expenses; while persons of acknowledged abilities received from twenty to forty shillings and upwards; which was a considerable inducement for those whose genius pointed that way to qualify themselves for the profession; whereas, our pay at present is no more than two Continental Dollars a day, without any kind of allowance or emolument, except a ration and travelling expences, a charge allowed in every profession.

The officers in the line of the Army, have received a considerable addition to their pay, under the denomination of subsistance money; besides the benefit of State supplies: and the wages of other Departments of the Army, whose pay was formerly less than ours, has been greatly


TAPPAN SEA.
NORTH RIVER.
EXPLANATIONS.
Norwalk
Stamford
Greenwich
Byram River
Scale

augmented; while we have been entirely overlooked, merely for want of having proper application in our behalf.

In the present case, we are far from wishing to raise fortunes by the calamities of our Country; but at the same time we believe our Country is as far from wishing us to present our fortunes to them, along with our services, without any prospect of reimbursement, which at present is the case. Our pay, so far from supplying us with clothes, has not been adequate, for these twelve months past, to the furnishing us with shoes, and now is not sufficient for washing.

If therefore the continuance of our Service be thought necessary, we have no doubt that the Surveying Department will be so arranged, as in some degree to make up for the Depreciation; and fix our pay in such a manner, as shall prevent the like inconvenience in future; the readiest way to do which, in our opinion, would be to regulate it by the price of Specie.

—Heusser, ***Washington's Map Maker***, pp. 208–09.

Upon Erskine's sudden death in October 1780, his 24-year-old assistant, Simeon DeWitt, immediately succeeded him. The following spring Congress created a new position, geographer general of the southern army.[28] Capt. Thomas Hutchins, a respected engineer and cartographer, filled the post. During the climactic Yorktown campaign of 1781, both geographers and their assistants provided invaluable aid to the Army. After the peace DeWitt resigned to become surveyor general for New York State; Hutchins remained with the Army to direct surveys in the Northwest Territory.[29]

SURVEY OF NEW YORK AND CONNECTICUT. *Under the direction of Robert Erskine (1735–80), the geographer's department accomplished a tremendous amount of work. This survey, prepared in 1778 by Erskine with the assistance of William Scull, was one of the numerous sketches designed to aid Washington. The key,* at right, *shows symbols for roads, both surveyed and unsurveyed, and for footpaths, "commanding heights," and taverns. By 1780 Erskine reported that "from the Surveys made, and materials collecting and already procured, I could form a pretty accurate Map of the four States of Pennsylvania, New Jersey, New York and Connecticut" (Erskine to Philip Schuyler, 12 February 1780, quoted in Heusser,* Washington's Map Maker, *p. 209).*

Courtesy New-York Historical Society, New York City

Chapter II

THE FORMATION OF THE CORPS OF ENGINEERS AND THE RECRUITMENT OF ENGINEER TROOPS

In the autumn of 1776, Silas Deane continued to recruit experienced engineer officers abroad. At home, on September 16, Congress authorized enlargement of the Continental Army to 88 infantry battalions. Col. Rufus Putnam seized the opportunity and submitted to General George Washington the first plan to establish a corps of engineers as a permanent and distinct branch of the Army with its own regulations. In an explanatory letter, Putnam argued that engineer troops comprising artificers and sappers and miners were essential if the corps's officers were to execute fortifications satisfactorily. As Chief Engineer and a trusted advisor, Putnam pressed Washington to act expeditiously.

Keenly aware that technically skilled officers were rare, Putnam regarded the implementation of his plan as a means of supplying the Army with "regular-bred" engineers. As for himself, he said: "I . . . [have] not the vanity to supose that my knowledge . . . [is] Such as to give me a Claim to the first rank in a Corps of Engineers."[1] He offered to resign in favor of a more qualified officer when the time came.

1. "WITH OUT A CORE OF ENGENEERS . . . THE WORKS NEVER WILL BE PROPERLY EXECUTED NOR DON IN A REASONABLE TIME"

Rufus Putnam to George Washington.

September 26, 1776

I Hope the Importence of the Subjects will be as Sufficient appollogie for the Freedom I take in addressing your Excelency at this time. I have long Wondered that no Corps of Engeneers was yet Established. The Number of Works to be Executed; the Nesesity of Dispatch in them; the Imposability for Common hands to be made at once to Comprehend what they ought to do. With out a Core of Engeneers is Established the Works Never will be properly Executed nor don in a Reasonable time. And I Cannot give my Ideas of Such a Core and there duty Better then In the Words of Mr.

Maigrets.[2] Speaking of them; Subordinary Disepline he Sais the first part of the Disepline Consists of the Divition of one Corps Into Several. And the Subdivition of the Latter into Still less; again: in the Construction of places that Corps of Workmen are Devided into Several others Who are called Bands. The officers of Each of those Companys Should be Engeneers. And tis a Leading Circumstance to the Success of any action that the Soldiers and there officers Should be acquainted with Each other Before hand. And tis from the Engeneers that the former are to Recive ordors for the Works of attack; defense; and Construction of places. Tis Evedent that the latter ought to be charged With the Conduct and Command of them. Engineers are the Natural officers of Workmen. Ancient and constent useage has Confirmed the practise. Again: if teachers Ware appointed to Each of these priniple Corps, Such a Number of Hopefull youth might be formed as would be a grate Benifit to the Service. These Work men are properly Speeking Soldiers or Rather Both one and tother. There Business Being Either Fighting or Working as ocation Requiers. The first Excersise to be taught them is the use of there arms; the Next is to keep them to there Business. The third kind of Exercise is the Instructing them in the Several forms of Dementions and Properties of Works. Again. All Workmen Imployed in Building of any kind may Serve very well for Works of Fortification. Again: by this means you may have good Miners and Sappers in abundence who in time of Seages may Ease the Engineers and Even Supply the Want of them up on ocation. Two years Experiance has fully Convinced me Sir that till the Engineers are Rendered Intependent of any other Department for there artificers till they have Miners and Sappers or persons Seperate from the Common Futeague men to take Care of Sinking the Ditch properly laying the turf well and to Build the parrapet with its propper Talus. I say till this is don No Engineer will be able to Execute his Works Well. Nor do them in a Reasonable time. The Service has already Suffered Much and will Continue So to do till Some Such Corps as

RUFUS PUTNAM. *Millwright, surveyor, and member of a company of carpenters during the French and Indian War, Putnam (1738–1824) served briefly as Washington's Chief Engineer in 1776. Despite Putnam's lack of training, the Commander in Chief quickly grew to regard him as his favorite engineer. Even after taking a line command at the end of 1776, Putnam continued to give Washington engineering advice, occasionally erecting fortifications or engaging in reconnaissance. After the war Putnam surveyed the Maine territory and, as a director of the Ohio Company, founded Marietta, Ohio. President Washington appointed him judge of the Northwest Territory in 1790 and later named him the first surveyor general of the United States. The portrait is by Charles Willson Peale.*

Independence National Historical Park Collection

what I have mentioned is Established and to Convince your Exilency that I have no Intristed motives but the Common good; in this adress I Beg leave . . . to Inst the Department Serve the army are or may be So well Suplyed with Reguler Bread Engineers.

—Washington Papers, roll 38.

In his plan Putnam designated the carpenters as the largest group among the artisans in each company of sappers and miners. He set the artisans' pay lower than that commonly given those hired on contract by the Army. The regular pay of the Chief Engineer remained unchanged.

2. PUTNAM DETAILS THE FIRST PLAN FOR A CORPS OF ENGINEERS

Rufus Putnam to George Washington.

October 3, 1776

The following establishment of artificers, etc., are in proportion to the eighty-eight battalions of Infantry as one company to five and a half battalions, which I think is as small a proportion as will answer the ends proposed. The battalions in general may give fifty each for the works; the miners and sappers are in proportion to these nearly as one to ten. The carpenters will not exceed, if we are to consider they have in charge the making of platforms, chevaux-de-frise gates, guardhouses, ordnance stores and barracks within the fortifications or necessary for the garrison of each place, and many other things in the Engineer department. I have had no regard to carriages, beds, boxes, and other matters belonging to the Artillery; nor wagons or other carriages belonging to the Quartermaster's Department or barracks for the quartering of troops in general, nor any stores for the Commissary (except for the different fortresses, these only come within the Engineer department.) However, if the carpenters are thought to exceed, there may be a part of them attached to the Artillery, and the same with regard to smiths, and they may also be employed in any other department, when the fortifications do not require their labour. For my own part I should rather choose to increase their number than lessen them some; if the service does not require their labour they are not to be paid more than other troops, and subject to like duty. . . .

	Field and Staff Officers in each Battalion	Their pay per month in doll[ar]s	Their extra allowances
			Dollars per month
1	Colonel or Chief Engineer	60	15 for a clerk
1	Lieut. Col. or Chief Director	50	15
1	Major or Sub-Director	40	15
1	Surveyor	33⅓	30 for 2 clerks
1	Adjutant	Their pay the same as in the Battalion service	
1	Chaplain		
1	Surgeon		
1	Mate		
1	Quartermaster		
1	Paymaster		

Each Company to consist of the following Officers, Artificers, etc., their pay the same as in the Batallion service:

		Their extraordinary allowance per day when employed in the works [*in dollars*]	
1	Captain or Engineer in ordinary	1/2	
1	Capt. Lieut. or Engineer extraordinary	3/8	
1	Lieutenant or Sub-Engineer	1/3	
1	Ensign or Practitioner Engineer	1/4	
4	Sentinels or Train men of Band	1/6	for each man
4	Corporals or 2 Train men of Band	1/7	
2	Drums and Fifes	——	
30	Carpenters or Wheelwrights	1/8	
5	Smiths	1/8	
6	Masons	1/8	
25	Miners and Sappers	1/8*	
20	Labourers	1/12	

*In time of siege one-fourth of a dollar.

—Force, *American Archives*, 5th ser., 2:892–93.

Noting that "some establishment . . . is highly necessary and will be productive of the most beneficial consequences," Washington quickly forwarded Putnam's plan to Congress.[3] When Congress failed to act, Putnam resigned his commission as engineer colonel and took command of the 5th Massachusetts Regiment. Truly dismayed by the loss of his favorite engineer, Washington protested to Congress: "Altho' he is not a man of Scientific knowledge, he is indefatigable in business and possesses more practicale Knowledge in the Art of Engineering than any other we have in this Camp or Army."[4]

Two months after taking command of the Army engineers in November 1777, Brig. Gen. Louis Duportail renewed pressure on Washington and Congress to establish a corps of engineers on a permanent basis. The Chief Engineer put forward his first written plan—reproduced below—in January 1778 at Valley Forge, where recent experience had convinced him of the need for additional engineer officers and for engineer troops.

At the outset Duportail stressed the Continentals' "deficiency in the practice of maneouvres." Requiring added protection in the field, the Army had no choice but to employ fortifications. Duportail wisely pointed out the value of artificial as opposed to natural fortifications: they were adaptable to all situations. As engineer troops Duportail favored "vigorous Soldiers" with "preference . . . given to Carpenters and Masons."

After less than six months in America, Duportail already recognized the need for a unified command of the engineer troops and for coordinated planning of defenses. He urged particular care in selecting officers for the companies of sappers as they would replace the French officers when they returned home. This concern about the future of the engineer corps in America was an important aspect of Duportail's plan. By proposing that the sappers and miners be "instructed in every thing that relates to the construction of Field works," he renewed Putnam's linkage of engineering education with the formation of companies of engineer troops.

Duportail preferred reassigning men from the line to the sappers and miners rather than recruiting. Ultimately both approaches were tried. Neither worked very well.

3. DUPORTAIL PROPOSES "AN ESTABLISHMENT WHICH IS ABSOLUTELY INDISPENSABLE"

Louis Duportail's plan for an engineering corps.

January 18, 1778

If fortification is necessary in any Armies, it is peculiarly so in those, which like ours, from a deficiency in the practice of manoeuvres cannot oppose any to those of the enemy—being necessitated therefore to receive him on their own ground, they ought always to be protected either by a natural or artificial Fortification, if it were only to have (under favor of the resistance of this fortification) sufficient time to ascertain the Result of the Enemy's movements—where his principal force is directed—and where his greatest effort is to be made.

With respect to natural fortification—all situations do not afford it—and to rely entirely upon it, would involve prodigious restraint in the choice of Positions and exclude many excellent ones considered relatively to the operations of War—it is therefore much more advantageous to have recourse to artificial Fortification which is applicable in all Situations.

The very great difficulties which I experienced in the last Campaign, both in setting on foot the most simple work and having it executed with the necessary Conditions, induce me to propose to His Excellency an Establishment which is absolutely indispensable, if he chooses to derive hereafter those succours from Fortification which it holds out to him.

I would desire to have companies of Sappers formed—they should be instructed in every thing that relates to the construction of Field works—how to dispose of the Earth—to cut the Slopes—face with turf or sods—make fascines—arrange them properly—cut and fix Palisades, etc.

The Sappers should be distributed in the different works, and a sufficient number of fatiguemen drawn from the line should be joined to them to work under their direction, by which means the work would be executed with a perfection and celerity which otherwise will ever be unknown in this army—it is, I believe, altogether useless to enlarge upon a matter so obvious—I proceed therefore immediately to the principal Conditions on which the Corps should be formed.

1st. The pay ought to be greater than that of ordinary foot soldiers because the Service is exceedingly hard—this is the practice in Europe, and they receive besides extraordinary pay when they work. Choice ought to be made of vigorous Soldiers and the preference should be given to Carpenters and Masons.

2. The Non-commissioned officers ought all to read and write, and be intelligent persons of good characters.

3. The Companies of Sappers ought to be altogether under the Command of the Head Engineer—for if the Major Generals had a right to employ them as they pleased, each, from a desire of fortifying his Camp in his own way, would ask for Sappers and they would all be taken from the Engineers. Besides as such partial works do not enter into the general plan of the position they are for the most part useless, ill concerted, and sometimes even dangerous.

4. The Captains of Sappers will be charged with the detail of their Companies, and each of them will be accountable to the Commanding officer of the Engineers in order that he may always know the State of the Companies, their Strength, etc.

5. Each Company should always have its Tools with it, carried on a waggon provided for the purpose—The Company should be answerable for all Tools lost—and in case any should be broken the pieces are to be produced to the officer to whom the detail of the Company is to be committed.

The Camp of the Sappers to be assigned by the Commanding officer of the Engineers adjacent to the place where they are to be employed.

Of the Officers—If it be important to choose the Privates in these Companies—it is much more so to choose the officers—The Congress ought, in my opinion, to think of forming Engineers in this Country to replace us when we shall be called home—The Companies of Sappers now proposed might serve as a school to them—they might there acquire at once the practical part of the Construction of Works, and if choice be made of young men, well bred, intelligent and fond of Instruction, we shall take pleasure in giving them principles upon the choice of Situations, and the methods of adapting works to the ground.

If His Excellency approves my Plan—I would advise the speedy execution of it—in order that the Companies may have served their Apprenticeship before the opening of the Campaign.

These Companies ought not to be composed of Recruits—but Soldiers answering the description above should be taken from the line for the purpose. While I am employed in representing the defects of my branch of the Army—I entreat His Excellency to observe that four Engineers are not sufficient—of the four, one is always detached and sometimes two, which is the case at present—and I am left with only one officer—it is impossible for us to do the Service of the Army. . . .

—Kite, *Duportail*, pp. 47–50.

Although Washington strongly endorsed Duportail's suggestions, Congress again delayed action.[5] However, on a recommendation from the Committee for Arrangements in the Army, Congress followed through on the plans of Putnam, Duportail, and Washington and voted on 27 May 1778 to establish three companies of engineer troops. The pay scale set by Congress was considerably higher than that put forward by Putnam. The engineer troops were to receive instruction in field fortifications. Their duties—the first engineering duties spelled out by Congress other than those given specifically to the Chief Engineer—were to guide fatigue parties in erecting fortifications and to repair damaged works.

4. "THEIR BUSINESS SHALL BE TO INSTRUCT THE FATIGUE PARTIES"

Resolution of Congress.

May 27, 1778

Resolved, That in the engineering department three companies be established, each to consist of—

		Dollars pay per month
1	Captain	50
3	Lieutenants, each	33⅓
4	Sergeants, each	10
4	Corporals, each	9
60	Privates, each	8⅓

These companies to be instructed in the fabrication of field works, as far as relates to the manual and mechanical part. Their business shall be to instruct the fatigue parties to do their duty with celerity and exactness: to repair injuries done to the works by the enemy's fire, and to prosecute works in the face of it. The commissioned officers to be skilled in the necessary branches of mathematics, the non-commissioned officers to write a good hand.

—Ford, ***Journals of the Continental Congress,*** **11:541–42.**

On 4 June 1778 Congress conveyed their resolution to the Commander in Chief with orders to put the new arrangements into effect. He readily complied and in general orders issued on the 9th called for three captains and nine lieutenants to officer the companies of sappers. These orders amplified Congress's resolve by stating that "as this Corps will be a school of Engineers it opens a Prospect to such Gentlemen as enter it and will pursue the necessary studies with diligence, of becoming Engineers."[6] Although nothing was said specifically at the time about the type of curriculum envisioned or how the instruction would be carried out, it was clearly intended that some sort of education would be available.

Difficulties in finding officers and enlisted men delayed full activation of the companies of sappers and miners more than two years. Duportail began interviewing officer candidates at once but volunteers came forward slowly. Of the eleven officers first nominated in March 1779, eight eventually received commissions.

As Duportail sought officers for the companies of engineer troops, Congress on 11 March 1779 passed a resolution forming the Army engineers into the Corps of Engineers. The Chief Engineer was required to report regularly to the Continental Board of War and the Commander in Chief and to propose annually the most advantageous placement of the engineers.

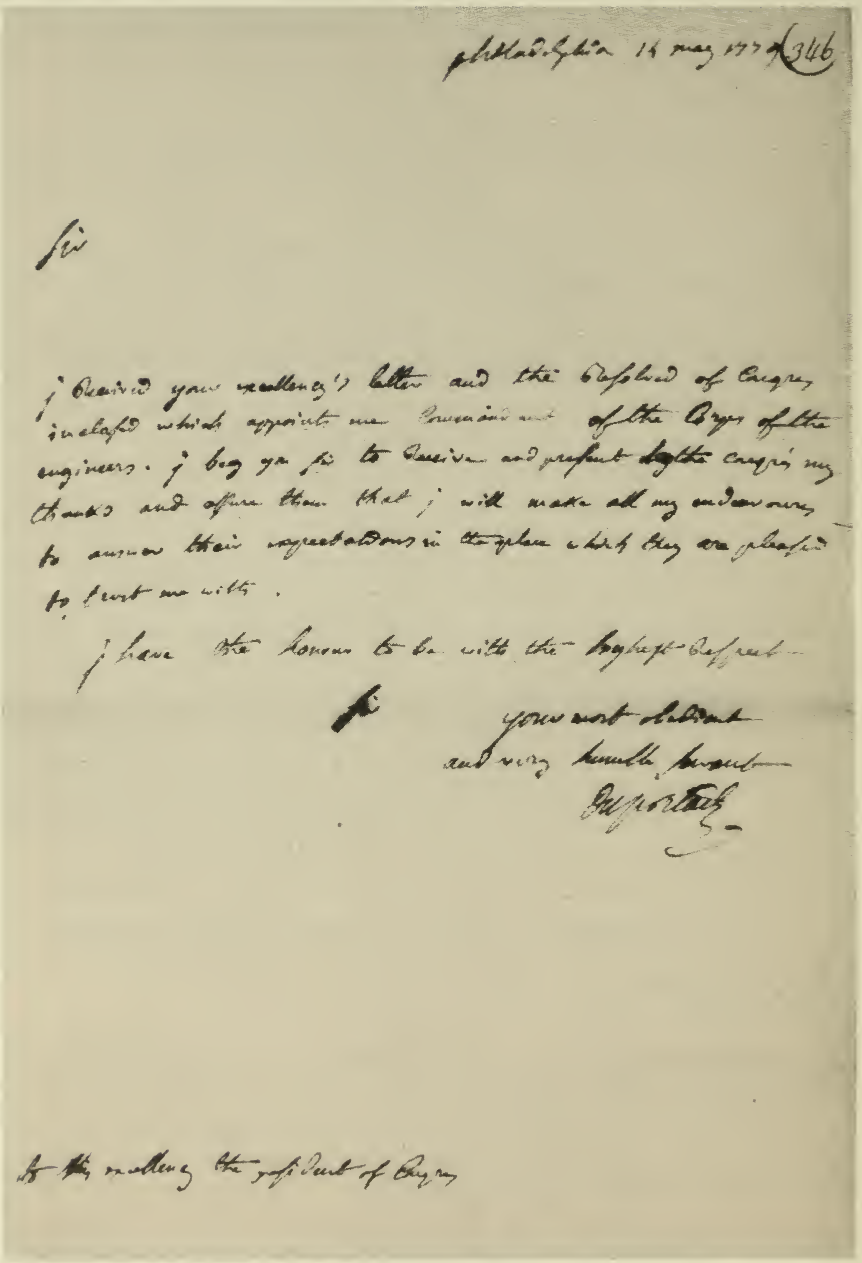
5. "THE ENGINEERS . . . SHALL BE FORMED INTO A CORPS"

Resolution of Congress.

March 11, 1779

Resolved, That the engineers in the service of the United States shall be formed into a corps, and styled the "corps of engineers;" and shall take rank and enjoy the same rights, honours, and privileges, with the other troops on continental establishment.

That a commandant of the corps of engineers shall be appointed by Congress, to whom their orders, or those of the Commander in Chief, shall be addressed; and such commandant shall render to the Com-



philadelphia 15 may 1777 346

Sir

j Received your excellency's letter and the Resolved of Congress inclosed which appoints me Commandant of the Corps of the engineers. j beg you sir to Receive and present to the congress my thanks and assure them that j will make all my endeavours to answer their expectations in the place which they are pleased to trust me with.

j have the honour to be with the highest Respect

Sir

your most obedient
and very humble servant
Duportail

to his excellency the president of Congress mander in Chief, and to the Board of War, an account of every matter relative to his department:

That the engineers shall take rank in their own corps, according to the dates of their respective commissions:

That every year, previous to the opening of the campaign, the commandant of the corps shall propose to the Commander in Chief and to the Board of War, such a disposition of the engineers as he shall judge most advantageous, according to the knowledge which he is supposed to have of their talents and capacity.

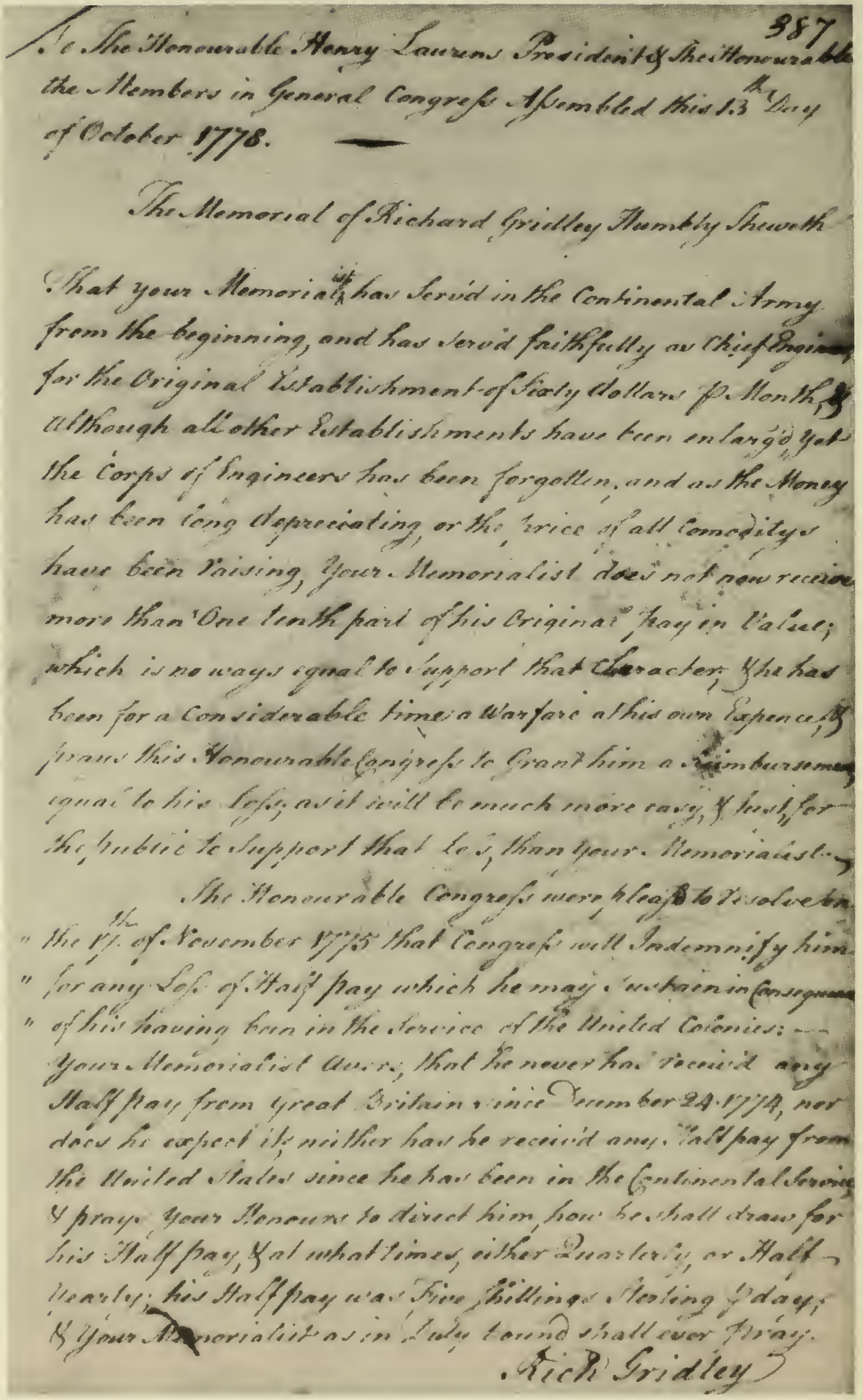
Resolved, That the Board of War be empowered and directed to form such regulations for the corps of engineers and companies of sappers and miners, as they judge most conducive to the public service; and that the Board report such allowances as they judge adequate and reasonable to be made to officers of the corps of engineers for travelling charges,and when on command at a distance from camp, or in places where they can not draw rations.

—Ford, *Journals of the Continental Congress,* 13:305–06.

Congress also devised regulations for the Corps of Engineers and the sappers and miners. After reviewing the regulations, Washington submitted revisions relating to extra pay and travel allowances. Highly sensitive to arousing jealousy in other branches of the Army, he contended that the regulations should stipulate extra pay only "in cases of extraordinary fatigue and danger." As for travel allowances, he preferred to deal with the engineers' special needs as part of a general regulation, "for discriminations always produce discontent."[7] Congress agreed and incorporated the changes.

The regulations, which follow, outline the duties of the Chief Engineer and his subordinates and clarify command relationships. Engineers were directed to take part in selecting and planning encampments, to make plans of the works under their direction, and to keep a journal of all sieges. The sappers and miners' main task was to construct field works as directed by the engineers, but when stationed at the head of the army on the march they were to perform the duties of pioneers, clearing the roads of obstructions and making repairs. Importantly, the regulations again addressed the issue of education: engineers were to lecture on technical subjects to the sappers and miners when they were not engaged with other duties.

LOUIS DUPORTAIL'S LETTER OF ACCEPTANCE. *In this letter to the president of Congress, dated 14 May 1779, Duportail accepted appointment as commandant of the Corps of Engineers.*
Record Group 360, National Archives



To The Honourable Henry Laurens President & the Honourable the Members in General Congreſs Aſsembled this 13th Day of October 1778. —

The Memorial of Richard Gridley Humbly Sheweth

That your Memorialist has Serv'd in the Continental Army from the beginning, and has Serv'd faithfully as Chief Engin for the Original Establishment of Sixty Dollars ℘ Month, & Although all other Establishments have been enlarg'd Yet the Corps of Engineers has been forgotten, and as the Money has been long depreciating or the Price of all Comoditys have been raising, Your Memorialist does not now receiv more than One tenth part of his Original pay in Value; which is no ways equal to Support that Character; & he has been for a Considerable time a Warfare at his own Expence, & prays this Honourable Congreſs to Grant him a Reimbursem equal to his Loſs, as it will be much more easy & just for the Public to Support that Loſs, than your Memorialist —

The Honourable Congreſs were pleaſd to Resolve on
" the 17th of November 1775 that Congreſs will Indemnify him
" for any Loſs of Half pay which he may Sustain in Consequen
" of his having been in the Service of the United Colonies: —
Your Memorialist Avers, that he never has receiv'd any Half pay from Great Britain since December 24·1774, nor does he expect it; neither has he receiv'd any Half pay from the United States since he has been in the Continental Servic & prays Your Honours to direct him, how he shall draw for his Half pay, & at what times, either Quarterly, or Half-Yearly; his Half pay was Five Shillings Sterling ℘ day; & Your Memorialist as in Duty bound shall ever Pray.

Richd Gridley

6. REGULATIONS FOR THE CORPS OF ENGINEERS

From George Washington's general orders.

July 30, August 2, and August 3, 1779

1st. The Commandant of the Corps of Engineers or commanding Engineer in an army shall render an account to the commanding General of every thing that concerns the service of the Corps, and shall, in all cases which relate to the department act under the orders and with the concurence of the commanding General.

2ndly. Whenever the army is on a march an Engineer shall attend the Quarter Master General or officer ordered to fix on the place of encamping, to give his advice and opinion thereon, and he shall also as soon as may be take a plan of the camp and report it to the General.

3rdly. The Commandant of the corps of Engineers and the commanding Engineer in a separate Army shall send plans of the more important positions and places occupied by the army in which they shall respectively serve to the board of War. These plans will of course be delivered to the Commander in Chief or General commanding a separate army by the Commandant of the Corps of Engineers or commanding Engineer.

The Subordinate Engineers will also report plans of works intrusted to them by their superior officers, to such superior officers; and no plans are to be communicated by any Engineer to any other person or persons whatever.

4thly. In the attack of Towns, Forts or fortified Camps of an enemy, by regular approaches, the commanding Engineer shall direct the operations under the authority and with the approbation of the commanding General, to whom he shall daily transmit a plan, marking out the progress of the attack and shall likewise from time to time transmit to the Board of War a plan of the said attacks together with a journal of the operations.

5thly. In a besieged place the commanding Engineer shall direct the defence of it under the orders of the commanding officer of the Garrison and he shall keep an exact journal of all the operations in order that it may serve for his justification and for that of the garrison in case of a surrender.

RICHARD GRIDLEY'S PETITION TO CONGRESS. *In this memorial dated 13 October 1778, Richard Gridley, chief engineer of the Army's Eastern Department, complained that Congress had not increased his original pay of $60 per month: "Although all other Establishments have been enlarg'd, . . . the Corps of Engineers has been forgotten." As prices had risen, money had depreciated to the point that he estimated his pay at no more than one-tenth its original value.*

Record Group 360, National Archives

Of the Companies of Sappers and Miners:

1st. Until men are inlisted for the purpose, Companies of Sappers and Miners not exceeding three shall be formed as circumstances may require by drafts from the line at the direction of the Commander in Chief and be under the command of the Commandant of the Corps of Engineers until otherwise ordered by Congress.

[*2ndly.*] Each company to consist of a Captain, a Captn. Lieutenant and a 1st. and 2nd. Lieutenant, four serjeants, four Corporals, one Drummer, one Fifer and Sixty privates.

3rdly. The duty of the Companies of Sappers and Miners shall be (under the direction of the Engineers) to construct field-works of every kind and all works necessary for the attack or defence of places as circumstances may require.

4thly. When a company or part of a company of Sappers and Miners is detached with any body of troops without an Engineer, the officer commanding the company or part of the company shall take his orders directly from the commanding officer of the troops, and whensoever an Engineer having the charge of any works shall be absent, the officer of the Sappers and Miners commanding the detachments employed in constructing them, shall direct the works agreeable to the plans and instructions formed by such Engineer.

5thly. When the Companies of Sappers and Miners shall not be sufficient to perform the duties assigned them, the commanding Engineer shall apply to the commanding General to furnish him with such a number of fatigue men from the line, as the service shall require.

6thly. The officers of the line detached with the command of fatigue parties, for assisting in constructing the works shall not interfere in directing them, but shall be wholly confined to keeping their soldiers employed and maintaining a proper order and discipline.

7thly. The Sappers and Miners shall, in case of extraordinary fatigue and danger, have such gratuities over and above their pay as the commanding Engineer with the concurence of the commanding General of the Army shall think they deserve.

8thly. The officers of Sappers and Miners shall enjoy the same rights honors and privileges with the officers of the like ranks in the other corps of the army.[8]

11thly. From the time the men are drafted and during their continuance in these companies they are to be left out of the Pay-Rolls of their respective regiments.

14thly. The Sappers and Miners shall be taught the established manual Exercise and Evolutions on days when they are not employed in the particular duties of their department and the same police and discipline shall be practiced in their companies as in the other parts of the army.

15thly. The Commandant of the Corps of Engineers shall take the most effectual and expeditious method to have the Sappers and Miners instructed in their duty, and as probably the officers of these companies whose talents and acquirements fit them for the profession, will be appointed Engineers, the Commandant of the Corps of Engineers shall form a plan of instructions for these officers which being approved by the board of War and Commander in Chief shall be carried into execution.

16thly. The Commandant of the Corps of Engineers shall appoint an Engineer or Engineers whom he shall judge but best qualified, to read lectures on fortification proper for towns or the field; on the manner of adapting fortifications to different grounds and positions; to regulate their extent according to the number of men intended to be covered; Upon Attack and Defence; Upon the use of Mines and their construction; Upon the manner of forming plans, reconnoitering a country and choosing, laying out and fortifying a Camp.

17thly. On a march, in the vicinity of an enemy, a detachment of the Companies of Sappers and Miners shall be stationed at the head of the column, directly after the Van Guard for the purpose of opening and mending the roads and removing obstructions.

—Fitzpatrick, *Writings of Washington,* 16:21–23, 37, 46–48.

Because of repeated complaints from line commanders, Washington suggested recruitment as an alternative to drafts from the line.[9] Congress offered a bounty of $200 to each enlistee and a $20 commission to the recruiting officer. In a letter seeking officers and enlisted men in Pennsylvania, Duportail stressed that Pennsylvania would benefit when her sappers and miners returned home, the officers having acquired "all the knowledge necessary to engineers" and the soldiers having learned "to Construct all the works relative to fortifications."

To be sure, Duportail had always believed that the sensitive nature of the engineers' work required officers of proven loyalty, but he rarely expressed the view with such openness. He was confident that instructors of mathematics attached to each company would remedy the educational defects of the young recruits.

7. "IT WOULD BE VERY ADVANTAGEOUS TO . . . PENSILVANIA TO FURNISH A NUMBER OF THESE SOLDIERS"

Louis Duportail to Joseph Reed, President of the Supreme Executive Council of Pennsylvania.

West point, 10th September, 1779

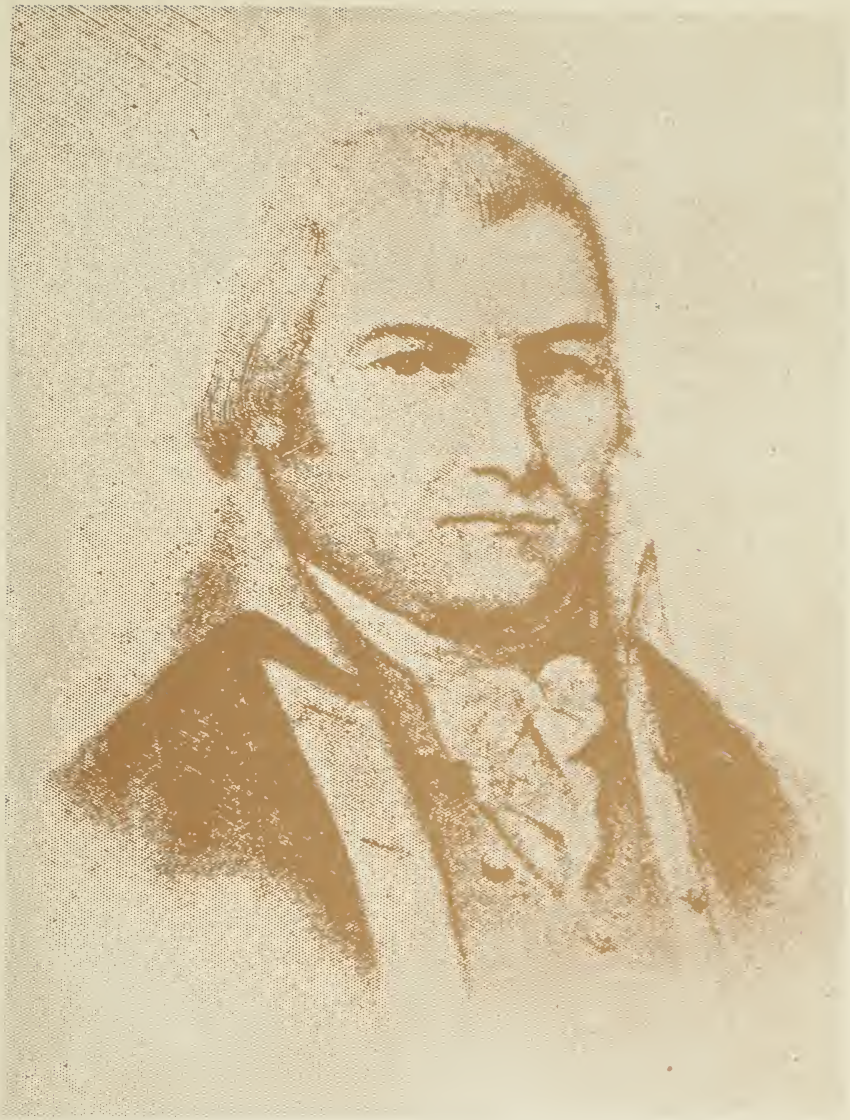
Sir,

Congress some time since ordered the formation of three Companies of sappers and miners, of which they were pleased to honor me with the

Command. The soldiers for these Companies were originally to be drafted from the line, but his excellency, general washington, finding some inconveniency in doing it at this time prefers their being raised. In Consequence he has written to Congress praying them to recommend it to the different states, to permit this levy, which Recommendation your excellency will probably receive. I therefore send Captain McMurray[10] into your state to recruit for these Companies and I intreat that you will be pleased to give the business all the aid of which it may stand in need.

Cap. McMurray has the regulations made by Congress for these Companies. I dare pray you to have the goodness to run them over and you will see what is to be their service and their instruction; you will see that the officers are to have the means of acquiring all the knowledge necessary to engineers, and that the soldiers will learn to Construct all the works relative to fortifications. May I therefore be permitted to observe that it would be very advantageous to the state of pensilvania to furnish a number of these soldiers who, returning into their own Country after being instructed, may be of the greatest utility to it. As I flatter myself your excellency will judge of it in the same manner, and your eagerness to form every kind of establishment useful to the state which you govern is well known, I take the liberty to propose to you the formation of one of these Companies of sappers and miners, to belong to the state itself. This plan has been mentioned to general washington and met his approbation in that case. As there are two vacancies in the Company of Mr. McMurray they Could be granted to two gentlemen of the the state of pensilvania for this purpose; if your excellency should be acquainted with any gentlemen disposed to embrace this profession and proper for it, I should esteem it a favor you would send them to me for examination. The qualities necessary for the officers of sappers and miners are in the first place a good education in general, which will be a security for the integrity of their sentiments. It must be Considered that these officers becoming Engineers and so in a situation to have in their hands the plans of the frontiers of the fortifications, the memorials concerning them, in a word all that has relation to the defence of the state, they ought to be qualified to inspire great Confidence in their fidelity and in their attachment to their Country; in the next place it is proper they should have some mathematical Knowledge—the more they have the better; but we may not exact a great deal from young men who do not exceed the age of twenty, who besides have had a good education, possess a fund of intelligence and show an inclination to instruct themselves, they may be the easier dispensed with, as there will be a master of mathematics attached to the Companies, and they will be furnished with regard to this object with all the means to supply the defects of their education.

—*Pennsylvania Archives,* 1st ser., 7:690–91.



MOSES CLEAVELAND. *Known best for founding Cleveland, Ohio, in 1796, Cleaveland (1759–1806) served during the Revolution as an officer in the sappers and miners. A native of Connecticut, Cleaveland graduated from Yale University before entering the Army in 1777. After the war he practiced law, joined his state's chapter of the Society of the Cincinnati, was a delegate to the Connecticut convention to ratify the U.S. Constitution, and, as a director of the Connecticut Land Company, speculated in land.*

Library of Congress

By the summer of 1780 the companies of sappers and miners still lacked a full complement of officers and enlisted men. According to the officers, the problem resulted in part because they had never "been put upon a proper footing for the recruiting business."[11] Meanwhile, the officers already on active duty were "acquiring a knowledge of the service to which they . . . were destined," but they waited impatiently to perform some worthwhile service for their country.[12]

Endeavoring to salvage the situation and get the troops he still needed, Washington reinstituted drafts from the line,[13] proposing to take one man from each regiment. Joseph Plumb Martin, who joined the sappers and miners as a corporal, was drafted in this manner. His engaging recollection, reproduced below, is the only surviving account by a member of the engineer troops.

Martin's narrative underscored the youthfulness of his corps, which sought "as intelligent young men as could be procured," although "some of us fell considerably short of perfection." With typical humor, Martin described the manner of his draft; hungry days without "belly timber"; and faithful service to his country, despite her being "a light-heeled wanton of a wife."

8. "THIS CORPS OF MINERS WAS RECKONED AN HONORABLE ONE"

From the narrative of Joseph Plumb Martin.

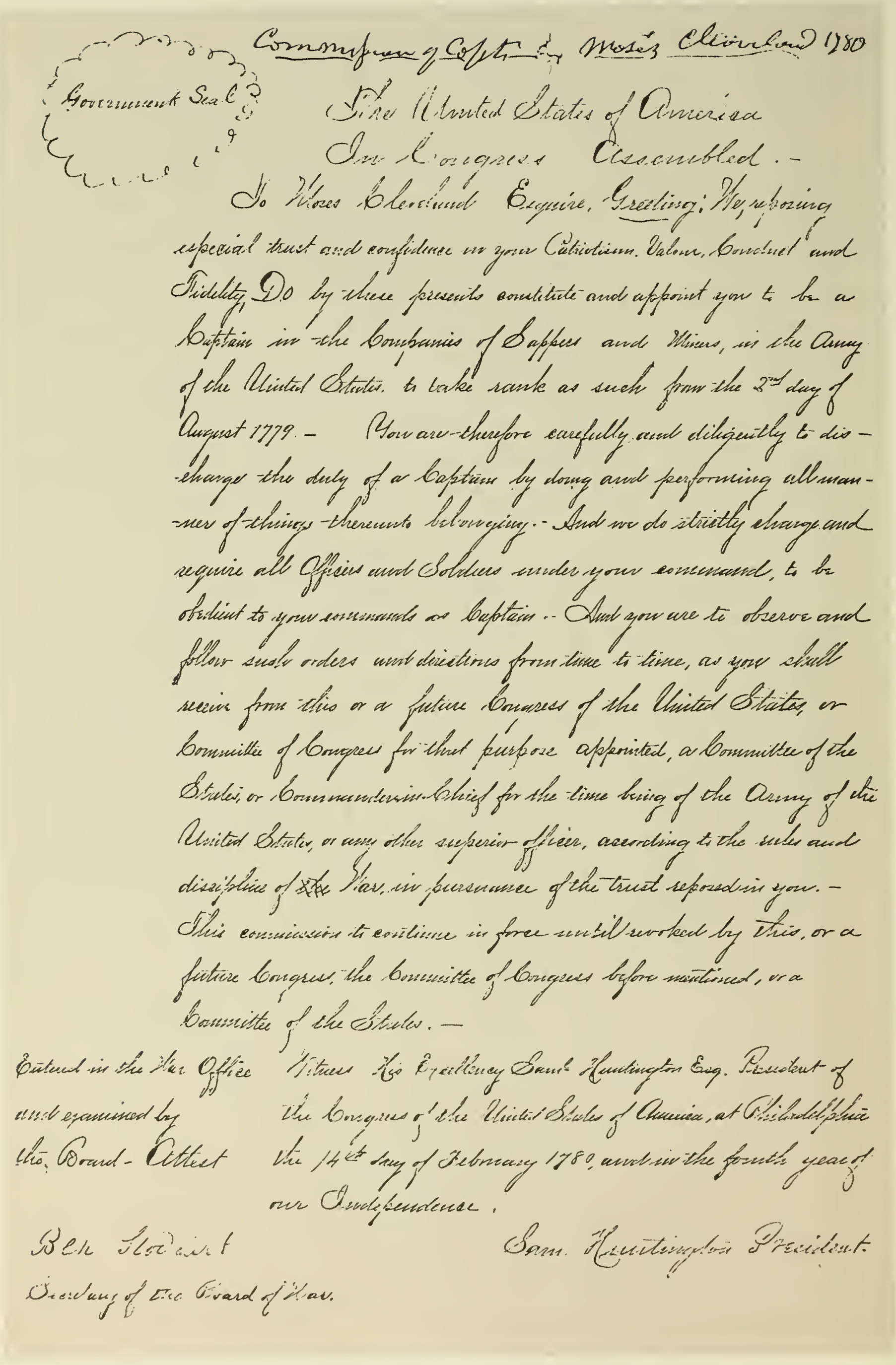
And now there was to be a material change in my circumstances, which, in the long run, was much in my favor. There was a small corps to be raised by enlistments, and in case of failure of that, by drafts from the line. These men were called "Sappers and Miners," to be attached to the engineer's department. I had known of this for some time before, but never had a thought of belonging to it, although I had heard our major (to whose company I belonged) tell some of our officers (after I had neatly marked his name upon his chest) that if there was a draft from our regiment, he intended I should go, although, he added, he did not wish to part with me. I, however, thought no more about it, till a captain of that corps [David Bushnell] applied for a draft of one man from each regiment throughout the whole army present. The captain was personally acquainted with our major and told him he would like to have him furnish him with a man from the regiment that he knew was qualified for a noncommissioned officer. The major then pitched upon me.

I was accordingly transferred to this corps and bid a farewell forever to my old comrades, as it respected any further associating with them, or sharing in their sufferings or pleasures. I immediately went off with this (now my) captain and the other men drafted from our brigade, and joined the corps in an old meetinghouse at the Peekskill. It was after dark when we arrived there. I had now got among a new set, who were, to a man, entire strangers to me. I had, of course, to form new acquaintances, but I was not long in doing that. I had a pretty free use of my tongue, and was sometimes apt to use it when there was no occasion for it. However, I soon found myself at home with them. We were all young men and therefore easy to get acquainted.

I found nothing more here for belly timber than I had in the line, and got nothing to eat till the second day after I had joined the corps. I have heard it remarked by the old farmers that when beasts are first transferred from one place to another, that if they keep them without food for two or three days, it will go far towards wonting them to their new situation. Perhaps it might be so thought by our commanders. Be that as it would, I got nothing, as I have said, till the second day I had been with them. We then drew, if I remember right, two days rations of our good old diet, salt shad, and as we had not, as yet, associated ourselves into regular messes, as is usual in the army, each man had his fish divided out by himself. We were on the green before the meetinghouse and there were several cows feeding about the place. I went into the house to get something to put my fish into, or some other business, and stayed longer than I intended, or rather ought to have done, for when I came out again, one of the cows was just finishing her meal on my shad; the last I saw of it was the tail of a fish sticking out of the side of her mouth. I was vexed enough to have eaten the weight of it off her carcass, but she took care of that, and I had another opportunity (if well improved) of mortifying my body by fasting two days longer, but I got something among the men, as poorly as they were off, to sustain nature till I could get more by some means or other. Such shifts were nothing strange to us.

This corps of Miners was reckoned an honorable one; it consisted of three companies. All the officers were required to be acquainted with the sciences, and it was desirable to have as intelligent young men as could be procured to compose it, although some of us fell considerably short of perfection. Agreeable to the arrangement between my former commander and my new captain, I was appointed a sergeant in this corps,[14] which was as high an office as I ever obtained in the army, and I had some doubts in my own mind, at the time, whether I was altogether qualified for that. However, I was a sergeant and I think I *did* use my best abilities to perform the duties of the office according to my best knowledge and judgment. Indeed, I can say at this late hour of my life, that my conscience never did, and I trust never will, accuse me of any failure in my duty to my country, but, on the contrary, I always fulfilled my engagements to her, however she failed in fulfilling hers with me. The case was much like that of a loyal and faithful husband, and a light-heeled wanton of a wife. But I forgive her and hope she will do better in future.

—Martin, *Private Yankee Doodle,* pp. 194–6, 198.



Commission of Captn. to Moses Cleveland 1780

Government Seal

The United States of America
In Congress Assembled. —

To Moses Cleveland Esquire, Greeting: We, reposing especial trust and confidence in your Patriotism, Valour, Conduct and Fidelity, Do by these presents constitute and appoint you to be a Captain in the Companies of Sappers and Miners, in the Army of the United States, to take rank as such from the 2nd day of August 1779. — You are therefore carefully and diligently to discharge the duty of a Captain by doing and performing all manner of things thereunto belonging. — And we do strictly charge and require all Officers and Soldiers under your command, to be obedient to your commands as Captain. — And you are to observe and follow such orders and directions from time to time, as you shall receive from this or a future Congress of the United States, or Committee of Congress for that purpose appointed, a Committee of the States, or Commander in Chief for the time being of the Army of the United States, or any other superior officer, according to the rules and discipline of War, in pursuance of the trust reposed in you. — This commission to continue in force until revoked by this, or a future Congress, the Committee of Congress before mentioned, or a Committee of the States. —

Entered in the War Office
and examined by
the Board - Attest

Witness His Excellency Saml. Huntington Esq. President of the Congress of the United States of America, at Philadelphia the 14th day of February 1780, and in the fourth year of our Independence.

Ben Stoddert
Secretary of the Board of War.

Sam. Huntington President.

By fall 1781 the companies of sappers and miners were fully activated and ready to participate in the Yorktown campaign. The extent to which the engineer troops provided technical education is unclear. On 26 May 1780, for example, several officers complained that the regulation regarding lectures on fortifications and mining was not being carried out.[15] Martin's detailed account of life within the engineer corps after 1780 said nothing about officers receiving any type of instruction, even during long periods when the companies were stationed at West Point and presumably had some free time. Nor did Duportail's correspondence with the engineer officers under his command contain orders to read lectures to the sappers and miners. Apparently what knowledge of fortifications, mining, and reconnaissance the sappers and miners gained was largely the result of their experience in the field.

COMMISSION IN THE SAPPERS AND MINERS. *Draft of a commission as a captain in the sappers and miners issued to Moses Cleaveland on 14 February 1780 but backdated to 2 August 1779.*
Western Reserve Historical Society

Chapter III

BUNKER HILL AND THE SIEGE OF BOSTON
1775–1776

At Lexington and Concord on 19 April 1775 American resistance to British policies successfully turned from words to arms. The colonists repulsed the British attempt to capture their supplies, drove the redcoats back to Boston, and determined to keep them there.

Early in May a reconnaissance party including Col. Richard Gridley, chief engineer of the Massachusetts forces, surveyed the area surrounding the main American camp at Cambridge. The group recommended constructing several redoubts and breastworks including "a strong redoubt on Bunker Hill," lying on Charlestown peninsula just north of Boston.[1] Before long some fortifications appeared near Cambridge, but the patriots postponed work at Bunker Hill and Dorchester Heights southwest of Boston until they were better able to man the positions. Gridley was convinced earthworks were required to keep the enemy "from getting into the Country to lay it waste," but he was "much embarras'd for want of assistance, as there were but very few that had any knowledge of . . . [engineering]."[2]

By June about fifteen thousand Americans, the majority of them New Englanders, had assembled around Boston. Hemmed in, the enemy entrenched and delayed further offensive operations. On the 12th of that month General Thomas Gage, the British commander, decided to occupy the unfortified Dorchester Heights. The next day, when they discovered Gage's plan, the Americans countered with the decision—recommended earlier—to entrench on Bunker Hill, the highest of the three hills on Charlestown peninsula.

At six o'clock on the evening of June 16, colonial forces assembled in Cambridge under orders from the Massachusetts Committee of Safety. Just before the entrenching started, according to one eyewitness, the chief engineer participated in a discussion in which it was decided first to fortify Breed's Hill, also on Charlestown peninsula but closer to Boston, and then to place a secondary work on Bunker Hill. Gridley objected on grounds that it was useless to "intrench on Charlestown Hill [Breed's Hill] 'till we had thrown up some works on the north and south ends of Bunker Hill, to cover . . . men in their retreat, if that should happen."[3] But Gridley, over-

THE BATTLE OF BUNKER HILL. *This lithograph was made in 1875, the year of the Bunker Hill centennial.*
Library of Congress

ruled at the scene by Maj. Gen. Israel Putnam, dutifully laid out a redoubt about forty yards square with a six-foot parapet mounted with gun platforms of earth and wood.[4] Gridley's redoubt, one British officer later declared, "must have been the work of some days; it was very regular, and exceeding strong."[5] The *Gentleman's Magazine* of London called the redoubt "well executed" and described it as follows:

> In the only side on which it could be attacked were two pieces of cannon. In the two salient angles were two trees, with their branches projecting off the parapet, to prevent an entry being made on the angles. The two flanks . . . of the intrenchment were well contrived, as the fire from them crossed within twenty yards of the face of the redoubt.[6]

Although British scouts heard the picks and shovels, it was after four in the morning before they fully realized what the Americans were up to. The enemy began an immediate cannonade and prepared to outflank the American left between Breed's Hill and the Mystic River and then to make a frontal assault on the rebel redoubt.

While the British slowly set their plan in motion, the patriots, under Gridley's direction, erected three flèches and a breastwork on their exposed left flank. A rail fence further secured the path to Bunker Hill along the left flank and the Mystic River. In the early afternoon of the 17th, Sir William Howe, one of four British generals in Boston, landed without opposition on

Charlestown peninsula and after a two-hour delay made a frontal assault on the rail fence and the redoubt.

Holding their fire until the enemy troops were within fifty yards, the colonials managed to turn back the attacks. Minutes later Howe struck again, focusing this time on Gridley's redoubt. But the colonists' musketfire was more devastating than before. The British fell back again. A third assault by fresh troops ended in hand-to-hand combat as the enemy stormed into the redoubt and drove the defenders out. Gridley was one of approximately 300 Americans wounded. About 140 Americans died, while British casualties—226 killed and 828 wounded—exceeded those of any other battle in the Revolution.

Despite the outcome, the rebels showed remarkable determination in defending Breed's Hill from behind their hastily erected defenses. Their performance demonstrated General Putnam's belief that "Americans were not afraid of their heads, though very much afraid of their legs; if you cover these, they will fight forever."[7] The quality of leadership and devastating musketfire of the Americans enabled them to hold out as long as they did.

Peter Brown, a company clerk under Col. William Prescott, commander of the redoubt on Breed's Hill, left a vivid, though somewhat inaccurate, account of the fortification and ensuing battle.

1. "ALTHO' WE WERE BUT FEW . . . WE WERE PRESERVED IN A MOST WONDERFUL MANNER"

Peter Brown to his Mother.

June 28, 1775

Frydy the 16th of June we were ordered to Parade at 6 o'clock with one Day's provisions and Blankets ready for a March somewhere, but we did not know where. So we readyly and cheerfully obeyd, the whole that was called for, which was these three . . . Reg[imen]ts . . . . About 9 o'Clock at night we marched down on to Charlesto[wn] Hill against Cox Hill in Bo[ston] where we entrenched, and made a Fort of about *Ten Rod long and eight wide*,[8] with a Breast Work of about *8 more*. We worked there undiscovered till about 5 in the Morn and then we saw our Danger being against 8 ships of the Line and all Boston fortified against us.

(The Danger we were in made us think there was Treachery, and that we were brot there to be all slain, and I must and will venture to say that there was Treachery, Oversight or Presumption in the Conduct of our Officers.) And about half after 5 in the Morn, we not having above half the Fort done, they began to fire, I suppose as soon as they had Orders, pretty briskly a few Minutes, and then stopt, and then again to the Number of about 20 or more. They killed one of us, and then they ceased till about 11 o'Clock and then they began pretty brisk again; and that caused some of our young Country [people] to desert, apprehending the Danger in a clearer manner than the rest, who were more diligent in digging and fortifyg ourselves against them. We began to be almost beat out, being tired by our Labour and having no sleep the night before, but little victuals, no Drink but Rum . . . . They fired very warm from Boston and from on board till about 2 o'Clock, when they began to fire from the Ships in ferry Way, and from the Ship that lay in the River against the Neck to stop our Reinforcemts [which] they did in some Measure. One Cannon cut off 3 Men in two on the Neck of Land. (Our Officers sent time after Time after the Cannons from Cambridge in the Morng and could get but four, the Capt. of which fired but a few times, and then swang his Hat round three Times to the Enemy, then ceased to Fire.) It being about 3 o'clock there was a little Cessation of the Cannons Roaring. Come to look there was a matter of 40 Barges full of Regulars comg over to us: it is supposed there were about 3000 of them and about 700 of us left not deserted, besides 500 Reinforcemt that could not get so nigh to us as to do any good hardly till they saw that we must all be cut off, or some of them, and then they advanced. When our Officers saw that the Regulars would land they ordered the Artill[er]y to go out of the fort and prevent their Landg if possible, from which the Artilly Capt. took his Pieces and went right off home to Cambridge fast as he could, for which he is now confined and we expect will be shot for it. But the Enemy landed and fronted before us and formed themselves in an Oblong Square, so as to surround us [which] they did in part, and After they were well formed they advanced towds us in Order to swallow us up, but they found a choaky Mouthful of us, tho' we could do nothg with our small Arms as yet for Distance, and had *but two Cannon and nary Gunner.* And they from Bo[ston] and from the ships a firg and throwg Bombs keepg us down till they got almost round us. But God in Mercy to us fought our Battle for us, and altho' we were but few and so were suffered to be defeated by them, we were preserved in a most wonderful Manner far beyond Expectation, to Admiration, for out of our Regt there was *about 37 killed, 4 or 5 taken* captive, and about 47 wounded. . . . If we should be called into Action again I hope to have Courage and strength to act my part valiantly in Defence of our Liberties and our Country, trusting in him who hath yet kept me and hath covered my head in the day of Battle, and tho' we have lost 4 out of our Compa[ny] and our Lieutenant's thigh broke and he taken Captive by the cruel Enemies of America, I was not suffered to be toutched altho' I was in the fort till the Regulars came in and I jumped over the Walls, and ran for about half a Mile where Balls flew like Hailstones, and Cannons roared like Thunder. . . .

—Dexter, *Literary Diary of Ezra Stiles*, pp. 595–96.

After the battle General Howe provided a detailed analysis of the American defenses from the enemy's point of view. Howe wondered at the value of his "victory." Of particular interest is his conclusion that the rebels' strategy—fortifying "every post in our way" and waiting "to be attacked at every one" while their forces were continually augmented from the countryside—would ultimately succeed.

2. "THE SUCCESS IS TOO DEARLY BOUGHT"

William Howe (probably to the British Adjutant General, Edward Harvey).

Camp upon the Heights of Charlestown
June 22 and 24 [1775]

. . . The troops were no sooner ashore than it was instantly perceived the enemy were very strongly posted, the redoubt upon their right being large and full of men with cannon. To the right of the redoubt they had troops in the houses of Charles Town, about 200 yards distant from the redoubt, the intermediate space not occupied, being exposed to the cannon of the Boston side battery.

From the left of the redoubt, they had a line cannon-proof, about 80 yards in length; and from thence to their left, close upon the Mystic River, they had a breast work made with strong railing taken from the fences and stuffed with hay, which effectually secured those behind it from musquettry. This breast work about 300 yards in extent—they had made the whole in the night of the 16th.

As a specimen of our knowledge of service, the centrys on the Boston side had heard the Rebels at work all night without making any other report of it, except mentioning it in conversation in the morning. The first knowledge the General had of it was by hearing one of the ships firing at the workmen, and going to see what occasioned the firing. Their works when we landed were crowded with men, about 500 yards from us.

From the appearance of their situation and numbers, and seeing that they were pouring in all the strength they could collect, I sent to General Gage to desire a reinforcement, which he immediately complied with, the remaining Light Companies and Grenadiers, with the 47th Battalion and 1st of the Marines landing soon after. Our strength being then about 2200 rank and file, with six field pieces, two light 12-pounders and two howitzers, we begun the attack (the troops in two lines, with Pigott upon the left) by a sharp cannonade, the line moving slowly and frequently halting to give time for the artillery to fire.

The Light Companies upon the right were ordered to keep along the beach to attack the left point of the enemy's breast work, which being carried, they were to attack them in flank. The Grenadiers being directed to attack the enemy's left in front, supported by the 5th and 52d, their orders were executed by the Grenadiers and 2 battalions with a laudable perseverance, but not with the greatest share of discipline, for as soon as the order with which they set forward to the attack with bayonets was checked by a difficulty they met with in getting over some very high fences of strong railing, under a heavy fire, well kept up by the Rebels, they began firing, and by crowding fell into disorder, and in this state the 2d line mixt with them. The Light Infantry at the same time being repulsed, there was *a moment that I never felt before*, but by the gallantry of the officers it was all recovered and the attack carried.

Upon the left, Pigott met with the same obstruction from the fences, and also had the troops in the houses to combat with, before he could proceed to assail the redoubt, or to turn it to his left, but the town being set on fire by order at this critical time by a carcass from the battery on the Boston side, Pigott was relieved from his enemies in that quarter, and at the 2d onset he carried the redoubt in the handsomest manner, tho' it was most obstinately defended to the last. Thirty of the Rebels not having time to get away were killed with bayonets in it. The little man [Pigot] is worthy of Our Master's [George III's] favour.

But I now come to the fatal consequences of this action—92 officers killed and wounded—a most dreadful account. I have lost my aid de camp Sherwin, who was shot thro' the body and died the next day. Our friend Abercrombie is also gone—he had only a flesh wound, but is said to have been in a very bad habit of body. The General's returns will give you the particulars of what I call this unhappy day. I freely confess to you, when I look to the consequences of it, in the loss of so many brave officers, I do it with horror. The success is too dearly bought. Our killed, serjeants and rank and file, about 160; 300 wounded and in hospital, with as many more incapable of present duty. The Rebels left near 100 killed and 30 wounded, but I have this morning learnt from a deserter from them that they had 300 killed and a great number wounded.

We took five pieces of cannon, and their numbers are said to have been near 6000, but I do not suppose they had more than between 4 and 5000 engaged.

The corps remained upon their arms the night of the action, where we are now encamped in a strong situation, with redoubts commanding the isthmus in our front, the enemy being in two corps about one mile and a half distant from us and both well entrenched; the principal body being upon a height called Summer Hill commanding the way from thence to Cambridge; the other called Winter Hill upon the road to Midford (or Mystich) on the side of Roxbury—they are also entrenched and have artillery at all their posts.

Entre nous, I have heard a bird sing that we can do no more this campaign than endeavour to preserve the town of Boston, which it is supposed the Rebels mean to destroy by fire or sword or both—and it is my opinion, with the strength we shall have collected here upon the arrival of the 4 battalions last from Ireland (one of which, with Bailey of the 23d, came in the day before yesterday), that we must not risk the endangering the loss of Boston—tho' should anything offer in our favour, I should hope we may not let pass the opportunity.

The intentions of these wretches are to fortify every post in our way; wait to be attacked at every one, having their rear secure, destroying as many of us as they can before they set out to their next strong situation, and, in this defensive mode (the whole country coming into them upon every action), they must in the end get the better of our small numbers. We can not (as the General tells us) muster more now than 3400 rank and file for duty, including the Marines and the three last regiments from Ireland.

—Fortescue, *Correspondence of King George III*, III, 221–24. Courtesy Curtis Brown Ltd., London.

Both sides improved their positions after Bunker Hill. The American fortifications advanced under Gridley's direction, with considerable assistance from his son and from Lt. Col. Rufus Putnam, Captains Jeduthan Baldwin and Josiah Waters, and Henry Knox.[9] Shortly after his arrival in

WASHINGTON TAKES COMMAND. *The newly appointed Commander in Chief of the Continental Army is portrayed assuming command at Cambridge, Massachusetts, 3 July 1775.*
Record Group 148, National Archives

Cambridge as Commander in Chief, General George Washington surveyed the progress. He noted that the British were placing strong entrenchments on Bunker Hill and Roxbury Neck, the isthmus linking Boston with the mainland. Their position was enhanced by the presence of stationary and floating batteries which enabled them to bombard the patriots. Washington's troops had entrenched at Roxbury and held a commanding view of the enemy's strongest position, the ground on Charlestown Neck taken from the rebels in June.

In his report to Congress, Washington attested that the Continentals had done the best possible job securing the line, given the handicaps of insufficient men, tools, and engineers. While supporting the decision "to hold and defend these Works, as long as possible," he also recognized what was to become a recurring concern—"the Difficulties which attend the Defence of Lines of so great extent."

3. "WE ARE AS WELL SECURED, AS COULD BE EXPECTED"

George Washington to the President of Congress.

Camp at Cambridge, July 10, 1775

Sir:

I arrived safely at this place on the 3d instant; after a Journey attended with a good deal of Fatigue and retarded by necessary attentions to the successive Civilities which accompanied me in my whole route. Upon my arrival I immediately visited the several Posts occupied by our Troops, and as soon as the Weather permitted, reconnoitred those of the Enemy. I found the latter strongly entrenching on Bunkers Hill about a mile from Charlestown, and advanced about half a mile from the place of the last Action, with their Centries advanced about 150 Yards on this side the narrowest part of the neck leading from this place to Charles Town. Their floating Batteries lay in Mystick River, near their Camp, and a twenty Gun Ship below the Ferry place between Boston and Charles Town. They have also a Battery on Copse [Copp's] Hill, on the Boston side, which much annoyed our Troops in the late Attack. Upon Roxbury Neck they are also deeply entrenched and strongly fortified. Their advanced Guard 'till last Saturday, occupied Brown's Houses, about a Mile from Roxbury Meeting House and twenty rods from their Lines: But at that time a party from General Thomas's Camp surprized the Guard, drove them in and burnt the Houses.

The Bulk of their Army commanded by General Howe, lays on Bunker's Hill, and the remainder on Roxbury neck, except the light Horse, and a few Men in the Town of Boston. On our side we have thrown up Intrenchments on Winter and Prospect Hills, the Enemy's Camp [on Bunker Hill] in full view, at the distance of little more than a mile. Such intermediate points, as would admit a Landing, I have since my arrival taken care to strengthen down to Sewall's Farms where a strong Intrenchment has been thrown up. At Roxbury General Thomas has thrown up a Strong Work on the Hill, about two hundred Yards above the Meeting House, which with the Brokenness of the Ground and Rocks, have made the Pass very secure. The Troops raised in New Hampshire with a Regiment from Rhode Island occupy Winter Hill. A Part of those from Connecticut under General Putnam are on Prospect Hill. The Troops in this Town are entirely of the Massachusetts: The remainder of the Rhode Island Men, at Sewalls Farm. Two Regiments of Connecticut and nine of the Massachusetts are at Roxbury. The residue of the Army, to the Number of about seven hundred, are posted in several small Towns along the Coasts, to prevent the depredations of the Enemy: Upon the whole I think myself authorized to say, that considering the great extent of Line and the nature of the Ground, we are as well secured, as could be expected in so short a time and under the disadvantages we labour. These consist in a Want of Engineers to construct proper Works and direct the Men; a Want of Tools and a sufficient Number of Men to man the Works in case of an Attack. You will observe by the Proceedings of the Council of War, . . . that it is our unanimous Opinion to hold and defend these Works, as long as possible. The Discouragement it would give the Men and its contrary Effect on the Ministerial Troops thus to abandon our Incampment in their Face, formed with so much Labour and expence; added to the certain Destruction of a considerable and valuable extent of Country, and the uncertainty of finding a place in all respects so capable of making a stand are leading reasons for this Determination. At the same time we are very sensible of the Difficulties which attend the Defence of Lines of so great extent, and the Dangers which may ensue from such a Division of the Army. . . .

—**Fitzpatrick**, ***Writings of Washington***, 3:320–22.

Gridley was often too ill to serve, but Washington was fortunate to have Baldwin, Putnam, and Knox to help supervise the works. In fact, the Commander in Chief reported that "most of the Works which have been thrown up for the Defence of our Several Incampments have been planned by a few of the Principal officers of this Army, assisted by Mr. Knox."[10] Because of the shortage of engineers, Maj. Gen. Charles Lee, an officer with wide experience in military affairs, worked "like ten post Horses" on the Boston defenses. "The undoing what we found done," he wrote in disdain of the patriots' earlier accomplishments, "gives us more trouble than doing what was left undone."[11] Yet Lee believed the enemy would suffer "a considerable hole in their seven thousand men" should they attack.

Despite the disadvantages cited by Washington and Lee, the colonists persisted in pushing forward their works under the continuous threat of a British offensive and frequent cannonade. As described by Capt. John Chester, the rebel advance within close range of Bunker Hill, while indecisive, placed the British at a distinct disadvantage.

4. "WE EXPECTED . . . THE KING'S TROOPS WOULD HAVE ADVANCED ON US, BUT THEY DURST NOT"

A letter of John Chester.

Camp at Roxbury, Aug. 28, 1775

. . . Last Saturday night a Large Party of 1000 working men and 3000 more as a Covering party, under the Command of Major General Lee, advanced from Prospect Hill, or Plowed Hill (as they call it) full Half way to Bunker Hill. They workd most notably by all acct, and got under cover before morning. When the enemy discovered them, they began a Cannonade, which lasted all Day long. I suppose above three hundred shots and Bombs were sent. I have not been able to Learn that they Killed more than two of our people. . . . Two or three [were] wounded . . . .

Every Day since we have had more or less cannonading. The matter did not disturb us at Roxbury, so but that we went to Church, etc., as usual, and yet not a canon was fired or Bomb Broke, but what we Could see from our encampment. We expected every moment when the King's troops would have advanced on us, but they durst not. Their Light Horse were Paraded, with a Great Show, but nothing done as to coming out. We at Roxbury have been advancing this same time. When you was here we had a slight Gabion Battery across the Road, 100 Rods on this side the George tavern. That was our most advanced work then, and where the main Guard used to be and is still posted, and is out of sight of the enemy. Since that we have intrenched in their sight about 100 Rods South East of that, but Lately have advanced North East, and begun a Long intrenchment Just by the Burying Yard, and continued it along to the North Eastward, on a Rising Ground just out of the marsh, till it comes to the east end of Lamb's Dam, which is further advanced (I believe) than the George tavern. We have frequently recd shots while at work but not till we got under cover (for we always begin in the night) and so they have killed none of us. We keep a large piquet guard by Lambs Damm every Night not less usually than 400, and the main Guard hard by. . . .

—*Magazine of American History,* 8:125.

Although dictated by circumstances — a severe powder shortage — Washington's defensive posture proved controversial. Throughout the summer, criticism of the army's inactivity mounted; and the anticipated departure of most of his troops when their enlistments expired at the end of the year led Washington, however reluctantly, to diverge from his basic strategy and propose an attack on Boston in September 1775. However, because it believed such a move to be inexpedient at the time, the commander's council of war rejected the plan.[12]

Irritated by Washington's reluctance to strike and at odds with the council's decision, Lee confided to a sympathetic Dr. Benjamin Rush:

> . . . We might have attack'd 'em long before this and with success, were our Troops differently constituted — but the fatal perswasion has taken deep root in the minds of the Americans from the highest to the lowest order that they are no match for the Regulars, but when cover'd by a wall or breast work. This notion is still further strengthen'd by the endless works We are throwing up — in short unless we can remove the idea (and it must be done by degrees) no spirited action can be ventur'd on without the greatest risk.[13]

But Lee lacked support and Washington and his advisors remained determined to engage the British only under clearly favorable conditions.

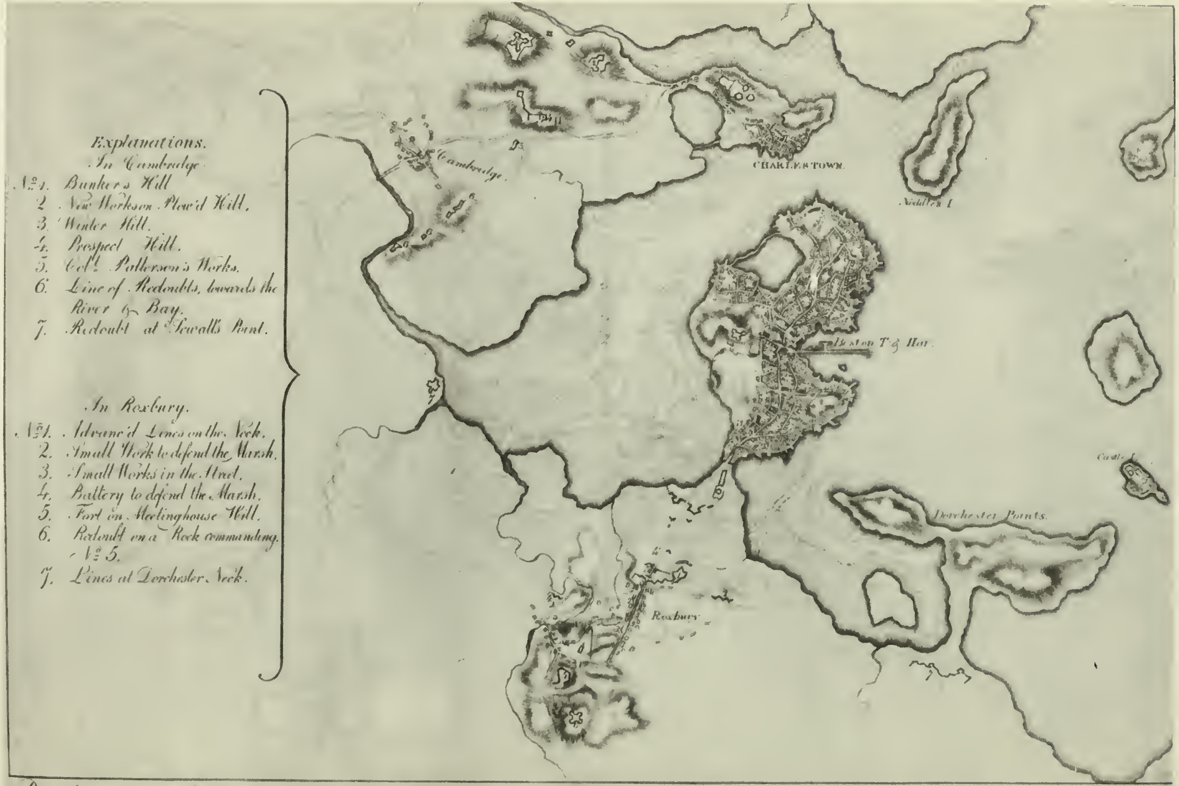
Nevertheless, the rebels accomplished much by the fall of 1775. One visitor provided this view of the American camp as it appeared in October:

> . . . I viewed the camps at Roxbury and Cambridge. The lines of both are impregnable; with forts (many of which are bombproof) and redoubts, supposing them to be all in a direction, are about twenty miles; the breastworks are of a proper height, and in many places seventeen feet in thickness; the trenches wide and deep in proportion, before which lay forked impediments; and many of the forts, in every respect, are perfectly ready for battle. The whole, in a word, the admiration of every spectator; for verily their fortifications appear to be the works of seven years, instead of about as many months.[14]

A local newspaper described Rufus Putnam's fortification at Cobble Hill as "the most perfect . . . that the American army has constructed during the present campaign."[15]

As Britain's Maj. Gen. John Burgoyne made clear when he viewed the American defenses at the end of the year, his government never intended to maintain Boston as a base of operations. The lay of the land and the patriots' skillful use of the terrain in erecting their defenses were deciding factors. "It is all fortification," Burgoyne declared. "Driven from one hill you will see the enemy retrenched upon the next and every step we move must be the slow step of a siege."[16]

Throughout the winter of 1775–76, the American position was precarious: shortages of powder and weapons continued to be acute and enlist-


Explanations.
In Cambridge.
Nº 1. Bunkers Hill
2. New Works on Plow'd Hill.
3. Winter Hill.
4. Prospect Hill.
5. Colˡ. Patterson's Works.
6. Line of Redoubts, towards the River & Bay.
7. Redoubt at Sewall's Point.
In Roxbury.
Nº 1. Advanc'd Lines on the Neck.
2. Small Work to defend the Marsh.
3. Small Works in the Street.
4. Battery to defend the Marsh.
5. Fort on Meetinghouse Hill.
6. Redoubt on a Rock commanding Nº 5.
7. Lines at Dorchester Neck.
Cambridge
CHARLESTOWN
Noddles I
Boston T & Har.
Castle I.
Dorchester Points.
Roxbury

Boston, & the Surrounding Country, & Posts of the American Troops Sepʳ 1775 J T ments expired with little guarantee that replacements would be forthcoming. The British maintained their grip on Boston proper, Charlestown peninsula, and Boston Neck; the rebels surrounded them from the Mystick River to Roxbury. Only Dorchester Heights remained unfortified.

On 16 January 1776 Washington convinced his generals to end the stalemate with an attack, but detailed plans were delayed until the uncertainties of manpower and powder could be overcome. One thing was sure: the Americans needed to act before spring, when fresh British troops were expected.

A month later Washington proposed crossing the ice-covered Charles River on foot and taking the enemy by surprise. The plan was fraught with peril. His generals balked. They favored a move to draw the enemy out of Boston. Accordingly, the rebels resolved to occupy Dorchester Heights, believing that the British would not be able to restrain themselves from making an attack.

The following five documents detail the American effort from December 1775 through early March 1776. Baldwin concentrated on Lechmere Point (east Cambridge), a position ultimately boasting a bomb battery and two redoubts. Unknown to Washington, Howe regarded the works at Lechmere Point as a serious threat. As Baldwin noted, enemy gunfire and frozen ground were major obstacles.

5. THE PATRIOTS ENTRENCH ON LECHMERE POINT

From Jeduthan Baldwin's journal.

11. [*December 1775*]. Finish the Fortification on Cobble Hill.

12. Begun the causey at Leachmor Neck.

13. Began the Covered Way onto Leachmor hill. . . .

14. Workt on leachmor point. Went in the afternoon to Dotchester point to See the mashine to blow up Shipping, but as it was not finished, it was not put into the water. . . .

16. Stakt. out the Fort on Leachmor point.

17. Went to work on Leachmor point. It was Very Foggy in the fornoon, and when the Fog cleared away we had a Very havey fire from the Ships, and from Boston but thro' Divine goodness we Recd by little damage. Abel Woods was wounded in the Crotch or thigh. Workt all night, got our men covered. . . .

19. Went upon Leachmor point to work. A No. of Shot and Shells were thrown from Bunker Hill and from Boston at us and at Coble Hill, many of

BOSTON AREA FORTIFICATIONS. *John Trumbull drew this map of American positions surrounding Boston in September 1775.*
Trumbull, *Autobiography*

the Shot lodgd in our Brest work, and some of the Bumbs Brok high in the are and 2 near our works, but no Mischief done this Day.

20. Went upon Leachmor Point. We recd a No of 24 lb Shot from Boston into our breastwork and others Just went over all in a direct line hit the wall. Several Bumbs burst in the air, one was thrown from Bunker Hill into Cambg by Phineys Regt. 13 inch which did not bust. . . .

26. Went to Leachmor point. Laid a platform for the Great Morter. Workt at the bridge, the Day fair and extreem cold. Dind with Genl. Washington and Lady. . . .

28. Went to Leachmor point finished the Bridge and 2 platforms in ye loer Baston [bastion].

29. Laid one platform for a morter in ye loer Baston and a platform for a cannon in ye upper Baston at Leachmor point. Cold.

30. Cut out two embrasures at Leachmor point. . . .

31. Lords Day. It Rained in the morning. No fateague this Day. Went to Meeting. Mr. Leonard Preacht from Exodus 111 and 10.

Jany 1, 1776. The Old Troops went of and left the lines bair in Some parts, cold.

2. Took a plan of the Fortification at leachmor point. Warm pleasant Day.

3. Went with 40 men to work at Leachmor in the forenoon, and to Watertown in ye afternoon, a warm pleasant Day. . . .

7. Lords Day, wort the Surceler [circular] Battery on Inmans point, and Cut out the obtuce ambrasure in the upper Bastion on Lechmor point, and throwd down the Stone wall there. Took a plan of Cobble Hill Fort. . . .

10. Had 5 teems carting Sodds, laid them in the new works, layd the Abertee [abatis] round the new works, cased the ambrasure in the uper Redout, . . . this Day Excessive cold and windy.

11. Workt at Lechmor point. Drawd in Abatree. Brok ground for the new work, finished laying out the work with Stones. It raind and Snowd in the Evning, and was a cold Day.

12. Workt at Lechmor pint. Had 100 Rifelmen to work with us 200 from Prospect Hill which made 300 in all, but found the Ground very hard frosen a foot thick in general. The oxen workt well this Day raw cold Chilley wind, Col. Miflin gave me a Quire of paper to Draw plans on. . . .

15. Workt at Lechmor point. It was a Raw cold Day and Snowd some. . . .Recd an order from Genl Putnam for wine, the order as follows, viz: . . . Deliver Col. Baldwin fifteen Gallons of Wine, which is necessary for health and comfort, he being every Day at the works in this Cold Season . . . .

19. Went to work at leachmor pint. The ground was frosen 22 inches Deep as hard as a rock, and in one night it frose in the trench 8 inches deep so that we pryed up cakes of frosen Earth 9 feet Long and 3 feet broad, it was fair but very cold this Day.

20. Workt. all Day at Lechmor point this Day clear and cold, could not dig Sods in the marsh it was so frosen.

21. . . . It was a cold Day went to Col. Gridleys in the Evning. Drank Coffey, and then went to Genl. Heaths, spent the remainder of the evning.

22. Workt. at Lechmor with a large party. Genl. Washington, Putnam and Gates, with several other Gentn came down to see the works. The ground was frosen in 2 feet deep and excessive hard, in some places, the men got thro the frost, and in other places they did not all, Day rold up an old wall into a line for a brestwork very cold and high tide this day. . . .

[*February*] *11.* Lords Day. Workt at Lechmor pint. It was a cold Day, the ground frosen very hard 28 inches deep. We made Very large mines under the frosen Surfice to get Earth to fill the parripets, the outsides of which was partly raised with Stone and part with timber. . . .

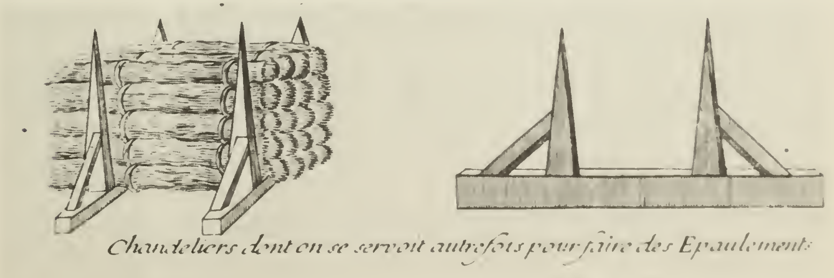
20. Workt. at Lechmor point. Dug round and undermind large pieces of frosen Earth which we rold out on Skids of Several Tons weight each, in diging for the Guard house, a fine pleasant Day.

—Baldwin, *Revolutionary Journal,* pp. 17–27.

In his memoirs Rufus Putnam recalled deliberations over the choice between attacking the British directly and drawing them out of Boston by fortifying Dorchester Heights. Putnam himself preferred the latter course but questioned the feasibility of digging new entrenchments in ground frozen more than a foot below the surface. The Commander in Chief challenged his favorite engineer to solve the problem.

In fascinating detail, Putnam related how, under "Singuler circumstances which I call providence," he arrived at a solution—that of using chandeliers, wooden frames filled with fascines and other material, to raise walls without breaking ground. Until he read about chandeliers in a borrowed book, Putnam was unfamiliar with the technique.

A CHANDELIER. *At Rufus Putnam's suggestion, the rebels used chandeliers successfully to defend Dorchester Heights in March 1776.*
Deidier, *Le Parfait Ingênieur Français*


Chandeliers dont on se servoit autrefois pour faire des Epaulements

6. PUTNAM RECALLS THE DECISION TO FORTIFY DORCHESTER HEIGHTS

From Rufus Putnam's memoirs.

1776 January and February—During these months the mind of General Washington was deeply engaged on a plan of crossing on the Ice and attacking the British in Boston—or endevor to draw them out by takeing possesion of Dorchester Neck.

Now with respect to takeing possession of Dorchester Neck there were circumstances which fell within my knowledge, and Sphere of duty, which were so evidently marked by the hand of an overruling providence that I think proper to relate them.

As Soon as the Ice was thought sufficiently strong for the army to pass over (or prehaps rather before) a Council of general officers was conveaned on the Subject. What there perticuler opinions were I never knew, but the Brigadiers were directed to consult the Field officers of there Several Regiments, and they again to feal the temper of the Captains and subbalterns.

While this was doing I was invited to dine at head Quarters, and while at diner General Washington desiered me to tarry after diner—and when we were alone he entered into a free conversation on the Subject of Storming the town of Boston.

That it was much better to draw the enemy out to Dorchester, then to atack him in Boston no one doubted, for if we could maintain our selves on that point or Neck of Land, our command of the town and Harbour of Boston would be such as would probably compel them to Leave the place.

But the Cold weather which had made a Bridge of Ice for our passage into Boston, had also frozen the earth to a great depth, especially in the open country Such as was the hills on Dorchester Neck.—So that it was impossible to make a Lodgment there in the usual way, however, the General directed me to consider the subject and if I could think of any way in which it could be don, to make report to him imediately.

And *now mark those Singuler circumstances* which I call providence.—I left head quarters in company with an other Gentleman, and in our way come by Genl. Heaths. I had no thoughts of calling untill I came against his door, and then I Sais, let us call on Genl. Heath, to which he agreed. I had no other motive but to pay my respects to the general. While there I cast my eye on a book which Lay on the table, Lettered on the back, *Mullers Field Engineer.*[17] I imediately requested the General to lend it me. He denied me. I repeated my requst. He again refused, and told me he never Lent his books. I then told him that he must recollect that he was one, who at Roxbury in a Measure compelled [me] to undertake a business which at the time I confessed I never had read a word about, and that he must let me have the book. After some more excuses on his part, close pressing on my part, I obtained the Loan of it. I arrived at my quarters about dark. It was the custom for the overseers of the workmen to report to me every evening what progress had ben made during the day. When I arrived there were Some of them already there. I put my book in the Chest, and if I had time I did not think of Looking in it that night.

The next morning as Soon as oppertunity offered I took my book from the Chest, and looking over the contents I found the word, Chandilears. What is that thought I. It is Somthing I never heard of before, but no sooner did I turn the page where it was described with its use but I was ready to report a plan for makeing a Lodgment on Dorchester Neck—(infidels may Laugh if they please).

In a few minuts after I had for my Self ditermined Colo. Gridley (the Engineer who had conducted the work at Cambridge) with Colo. Knox of the Artillery, who had ben directed to consult with me on the subject arrived. They fell in with my plan. Our report was approved of by the Genl and preperations imediately Set on foot to cary it into effect and every thing being ready for the enterprise, the plan was put in execution . . . . Such were the circumstances which Led to the discovery of a plan which obliged the enemy to Leve Boston. Viz.—a Lodgment made of Chandeliers, Fasciens, etc.

—Buell, *Memoirs of Putnam*, pp. 56–58.

As plans to fortify Dorchester Heights took shape, Putnam made a triangulation of enemy and colonial positions in greater Boston. Given the proximity of enemy guns, he determined that a covered way was absolutely necessary; and, as marsh turf was unavailable, Putnam recommended that the covered way be made of timber supported by stone and earth. Without explanation he declared that the enemy was not then in a position to take Dorchester. The implication was clear: the time was ripe for the rebels to act.

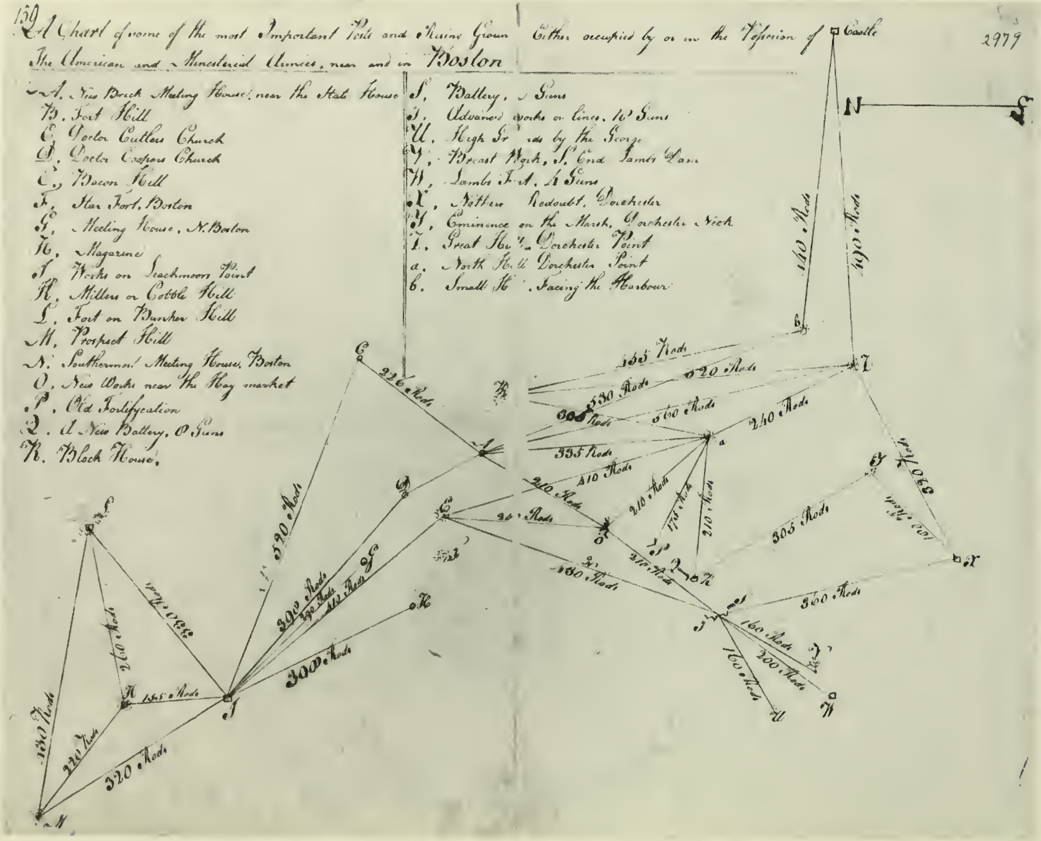
7. "THE ENEMY CANNOT TAKE POSSESSION OF DORCHESTER HILL AT PRESENT"

Rufus Putnam to George Washington.

Roxbury, 11 February 1776

May it Please Your Excellency:

You have Inclos'd a Chart of some of the most Important Posts and Riseing ground in and near Boston, which is as Exact as I am able to make



159 A Chart of some of the most Important Posts and Rising Groun Either occupied by or in the Possesion of The American and Ministerial Armies, near and in Boston

2979

A. New Brick Meeting House, near the State House
B. Fort Hill
C. Doctor Cutlers Church
D. Doctor Coopers Church
E. Bacon Hill
F. Star Fort. Boston
G. Meeting House. N. Boston
H. Magazine
I. Works on Leachmoors Point
K. Millers or Cobble Hill
L. Fort on Bunker Hill
M. Prospect Hill
N. Southermost Meeting House. Boston
O. New Works near the Hay market
P. Old Fortification
Q. A New Battery. 8 Guns
R. Block House.

S. Battery. Guns
T. Advanced works or lines. 16 Guns
U. High Gr ds by the George
V. Breast Work. S. End Lambs Dam
W. Lambs Fort. 4 Guns
X. Nother Redoubt. Dorchester
Y. Eminence on the Marsh. Dorchester Neck
Z. Great Hill on Dorchester Point
a. North Hill Dorchester Point
b. Small H . Facing the Harbour

from the little Leisure I have had to take Surveys of them, by this Draught it Appears that the Enemies works on the Neck is nearer the Causway going to Dorchester Point, than Bunker Hill is to the Cover'd way going on Leachmoors Point, therefore if a Cover'd way was Necessary in that case, it will be in this, should your Excellency think proper to order works thrown up on any part of the point. How this Cover'd way will be made is a Question. To procure upland or Marsh Turf at this Season is in my Opinion absolutely Impossible, and nothing short of Timber instead of Turf will Answer the purpose, the Method I have thot of is to side or Hew the Timber on two Sides only raising a single [Tier?] on the side of the Causeway. Raising a Parrapet of Stone and Earth next the Enemy. The Timber to be well Spliced together and if need be a post with a brace in about Fifty feet to support the Timber against the stone and Earth, I know Stone are bad in a Parrapet. But as they are easily Procur'd from the walls at Dorchester, and I think cannot be Driven through the Timber by any shot whatever, I would place them at the bottom and Cover the top with Earth which might be procur'd by opening a Pit for that purpose. About 200 Rods is Necessary to be made a Cover'd way which 80 Tons of Timber to Raise one Foot, and is in proportion to every foot, the Parrapet is High; I have been to the Swamp I mentioned to your Excellency the other Day. Find it between 12 and 13 Miles from the lines at Dorchester; there is near 100 Tons already got out besides a number of Mill Logs, the Carting from this place will be 12 [?] Ton, One Hundred Tons more may be had on these lands if the swamp Does not [break?] and no Doubt but Timber may be had in other Places, what your Excellency may think of so Costly a work I cannot tell, 'Tis the only method I know of, but wish a better way may be found out, I hope your Excellency will pardon my Officiousness in suggesting that I think this work may be Carried on with safety to the people Employ'd and to the Cause in general, as the Enemy cannot take Possesion of Dorchester Hill at present. Can we by any means have a Cover'd way in this frozen Season it will be of no small Consequence in taking Possesion of this Ground in a favorable Hour, the People who have been Employ'd by Mr. Davis in getting the Timber out of the Swamp will get no more unless your Excellency gives Orders for it. . . .

—Washington Papers, roll 35.

On 13 February 1776 Gridley and Knox, now a colonel and Gridley's successor as chief artillery officer, accompanied several American generals

PUTNAM'S TRIANGULATION OF BOSTON. *Rufus Putnam executed this triangulation of American and British positions for General Washington in February 1776.*
Washington Papers, Library of Congress

to Dorchester, where, according to Maj. Gen. Israel Putnam, Gridley "laid out works enough for our whole army for two years."[18] Although Washington's intelligence reports indicated the British were about to move out of Boston, he went ahead with his plan: Boston would be bombarded from Lechmere Point and Cobble Hill near Cambridge while the Dorchester Heights were being fortified. If the British attacked as expected, a force would simultaneously move into Boston from Lechmere Point. As a further precaution, Washington was prepared to occupy Nook's Hill, the point on Dorchester Heights closest to Boston. From there the patriots could fire directly on vessels loading at the town's principal wharves. If the British had not been beaten already, the occupation of Nook's Hill would mean the end.

After weeks of preparation, bolstered by the procurement of powder and the arrival of artillery from Ticonderoga, the rebels began fortifying the Dorchester Heights on the night of 4 March 1776. They completed their task by daybreak. The Americans, Howe reportedly remarked afterward, had done more work in one night than his whole army would have done in six months.[19] Archibald Robertson, one of Howe's engineers, called the colonists' effort "a most astonishing night's work."[20]

Two eyewitness accounts follow. As noted by James Thacher, a surgeon's mate, barrels filled with sand and stone were intended to make the position appear more formidable and complement Putnam's chandeliers. If necessary, the rebels would roll the barrels downhill to halt the enemy's advance. His emotions fired by the "preparations for blood and slaughter," Thacher prayed "that victory be on the side of our suffering, bleeding, country."

8. "THE AMOUNT OF LABOR PERFORMED DURING THE NIGHT . . . IS ALMOST INCREDIBLE"

From James Thacher's journal.

4th [*March 1776*]—The object in view is now generally understood to be the occupying and fortifying of the advantageous heights of Dorchester. A detachment of our troops is ordered to march for this purpose this evening; and our regiment, with several others, has received orders to march at 4 o'clock in the morning, to relieve them. We are favored with a full bright moon, and the night is remarkably mild and pleasant; the preparations are immense; more than three hundred loaded carts are in motion. By the great exertions of General [Thomas] Mifflin, our Quarter Master General, the requisite number of teams has been procured. The covering party of eight hundred men advance in front. Then follow the carts with the entrenching tools; after which, the working party of twelve hundred, commanded by General Thomas, of Kingston. Next in the martial procession are a train of carts, loaded with fascines and hay, screwed into large bundles of seven or eight hundred weight. The whole procession moved on in solemn silence, and with perfect order and regularity; while the continued roar of cannon serves to engage the attention and divert the enemy from the main object.

5th—At about four o'clock our regiment followed to the heights of Dorchester, as a relief party. On passing Dorchester Neck I observed a vast number of large bundles of screwed hay, arranged in a line next the enemy, to protect our troops from a raking fire, to which we should have been greatly exposed, while passing and repassing. The carts were still in motion with materials; some of them have made three or four trips. On the heights we found two forts in considerable forwardness, and sufficient for a defence against small arms and grape shot. The amount of labor performed during the night, considering the earth is frozen eighteen inches deep, is almost incredible. The enemy having discovered our works in the morning, commenced a tremendous cannonade from the forts in Boston, and from their shipping in the harbor. Cannon shot are continually rolling and rebounding over the hill; and it is astonishing to observe how little our soldiers are terrified by them. During the forenoon we were in momentary expectation of witnessing an awful scene; nothing less than the carnage of Breed's hill battle was expected. The royal troops are perceived to be in motion, as if embarking to pass the harbor, and land on Dorchester shore, to attack our works. The hills and elevations in this vicinity are covered with spectators to witness deeds of horror in the expected conflict. His Excellency General Washington is present, animating and encouraging the soldiers, and they in return manifest their joy, and express a warm desire for the approach of the enemy; each man knows his place, and is resolute to execute his duty. Our breast works are strengthened, and among the means of defence are a great number of barrels, filled with stones and sand, arranged in front of our works; which are to be put in motion and made to roll down the hill, to break the ranks and legs of the assailants as they advance. These are the preparations for blood and slaughter! Gracious God! if it be determined in thy Providence that thousands of our fellow creatures shall this day be slain, let thy wrath be appeased, and in mercy grant, that victory be on the side of our suffering, bleeding, country.

—Thacher, *Military Journal*,
pp. 46–47.

Rev. William Gordon, pastor of a Congregational church in Roxbury and Revolutionary chronicler, displayed a cool sense of detachment and a fine eye for detail as he gathered material for his projected history of the war.

9. "EVERY ONE KNEW HIS PLACE AND BUSINESS"

Rev. William Gordon to Samuel Wilson.

April 6, 1776

. . . All things being ready [March 4] as soon as the evening admitted of it, the undertaking went forward. The covering party consisting of 800 men led the way; then the carts with the entrenching tools; after that the main working body under Gen'l Thomas consisting of about 1200; a train of more than 300 carts loaded with fascines, presst hay, in bundles of seven or eight hundred, etc., closed the procession. Every one knew his place and business; the covering party when upon the ground divided, half went to the point next to Boston, the other to that next to the Castle [Castle William in Boston harbor]. All possible silence was observed. The wind lay so as to carry what noise could not be avoided, by driving the stakes and picking against the frozen ground (for the frost was still more than a foot thick, about a foot and a half) to carry, I say, what noise could not be avoided into the harbour between the town and the castle, so as not to be heard and regarded by such as had no suspicion of what we were after, especially as there was a continued cannonade on both sides. Many of the carts made three trips, some four.

Gen'l Thomas told me that he pulled out his watch and found that by ten o'clock at night, they had got two forts, one upon each hill, sufficient to defend them from small arms and grape shot. The men continued working with the utmost spirit, till relieved the Tuesday morning about three. The neighbouring militia had been called in for three days to guard against accidents, and were in by twelve at night, some before, in the evening. The night was remarkably mild, a finer for working could not have been taken out of the whole 365. It was hazy below so that our people could not be seen, tho' it was a bright moon light night above on the hills. . . .

—***Massachusetts Historical Society Proceedings*, LX, 361–64.**

As hoped, Howe planned an immediate offensive just as Gage had done when the rebels entrenched on Breed's Hill; but contrary winds delayed the attack long enough to allow the rebels to strengthen their works. These developments, coupled with Howe's troop and supply problems, made his position untenable. He reconsidered and chose instead to abandon Boston.

When the British departed on March 17, "the inhabitants discovered joy inexpressible."[21] Though many buildings were damaged, their town was not burned. In a final gesture of defiance, however, the British blew up Castle William, the harbor stronghold.

Col. Charles Stuart, son of Lord Bute, a former prime minister, reported the background of the British decision to depart Boston.[22]

10. THEIR POSTS WERE "MORE LIKE MAJICK THAN THE WORK OF HUMAN BEINGS"

Charles Stuart to Lord Bute.

Halifax, April 28, 1776

. . . We perceived two posts upon the highest hills of Dorchester peninsula, that appeared more like majick than the work of human beings. They were each of them near 200 ft. long on the side next the town, and seemed to be strong cases of packed hay about 10 ft. high with an abattis of vast thickness round both. We discovered near 6000 people, most of them at work; they opened embrasures before 9 oclock and about 2 oclock had made a ditch and connected the two hills by a breastwork.

We fired a few shots, but the position was too strong to be affected; the General therefore determined to attack it. A quantity of artillery and three regiments immediately embarked . . . .

. . . God knows whether it was a fortunate circumstance or not, but at any rate so high a wind arose that it was impossible for the boats to take to sea.

The next day the General assembled the field officers and acquainted us that the intended attack had failed through the inclemency of the weather, that he had consulted the engineers, who declared that the works had been so strengthened as to render any present attack very doubtful, and that should the enemy augment their works upon that peninsula from such a commanding height we should inevitably be drove from the town.

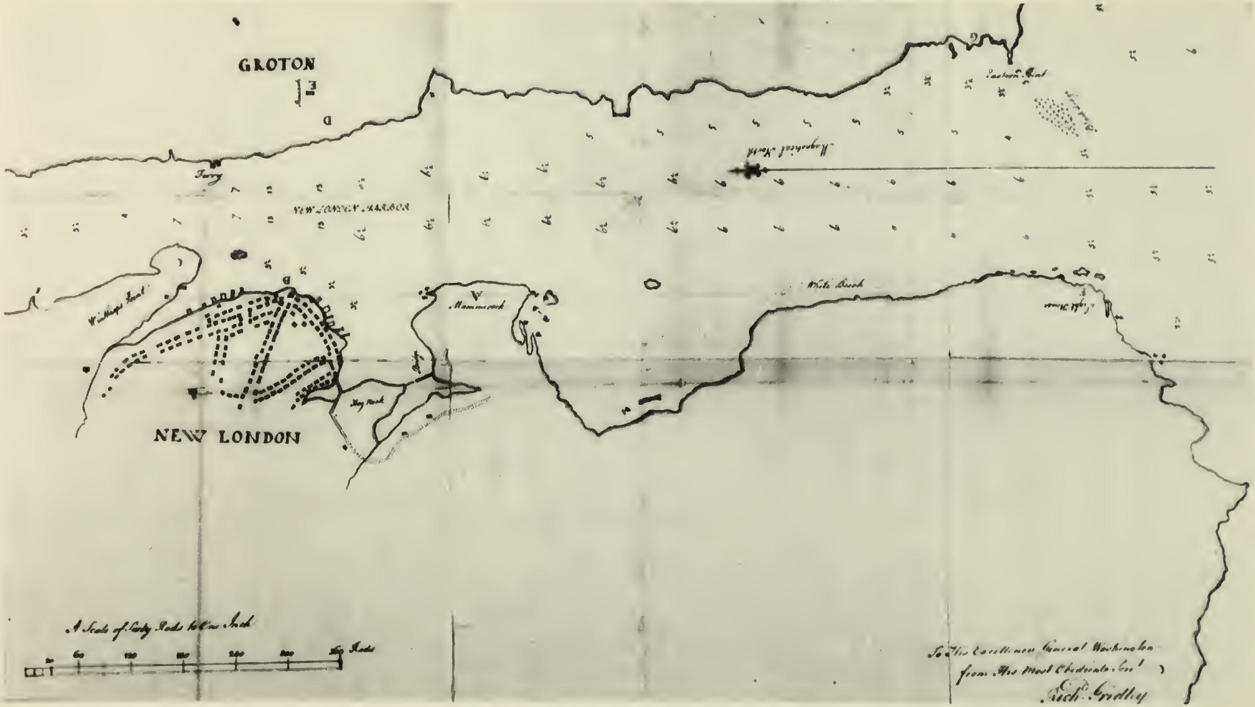
He also told us that there was no more than 6 weeks' provisions in the garrison, which obliged him to go to Halifax instead of to New York.

The principal citizens, on hearing that the town was to be evacuated, came to General Howe, and requested that the town might not be burnt; the General made answer that if the enemy molested him in his retreat he would certainly burn it; if not, he would leave the town standing.

This was made known by a flag of truce to the Rebels; in consequence of which we made our retreat unmolested. . . .

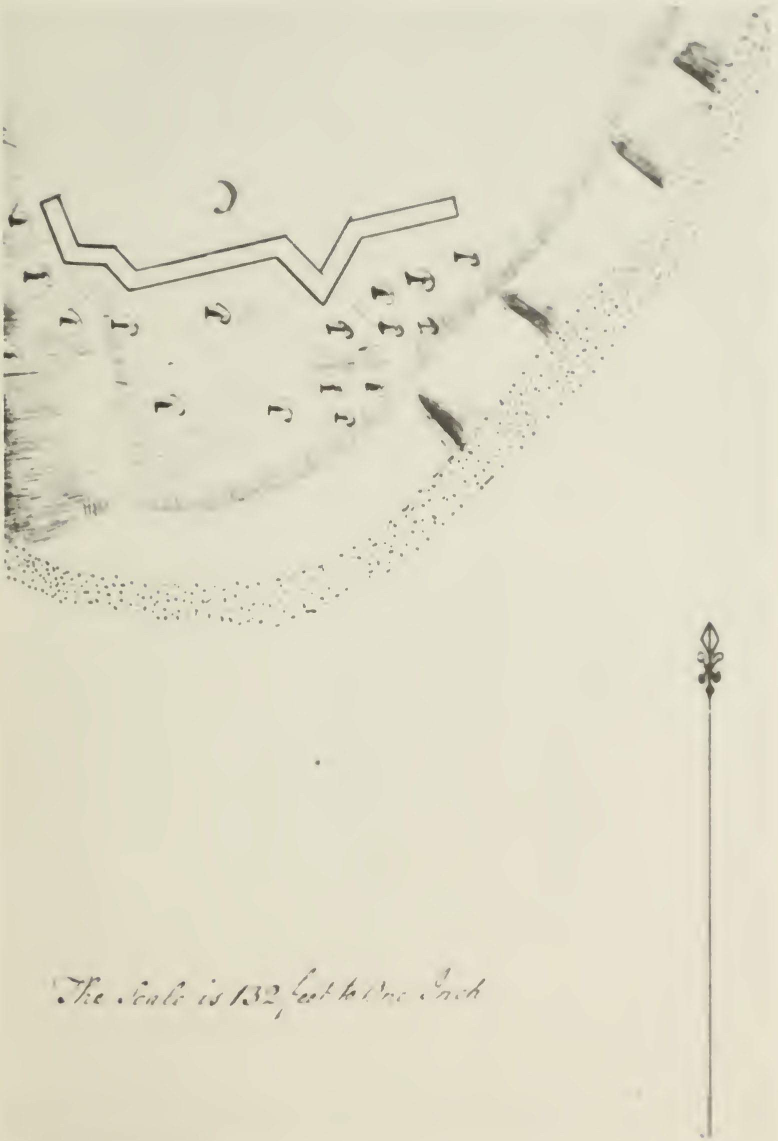
—Commager and Morris, *Spirit of 'Seventy-Six*, pp. 181–82.

British troops never again occupied Massachusetts, but fears that they might return generated immediate plans to strengthen fortifications in Boston harbor and in several coastal ports where the superior British navy might attempt raids. The enemy left behind well-executed works and artillery which although spiked was easily put back into service. Responsibility for overseeing the fortifications fell on Gridley, who remained as chief engineer in Massachusetts until 1781.

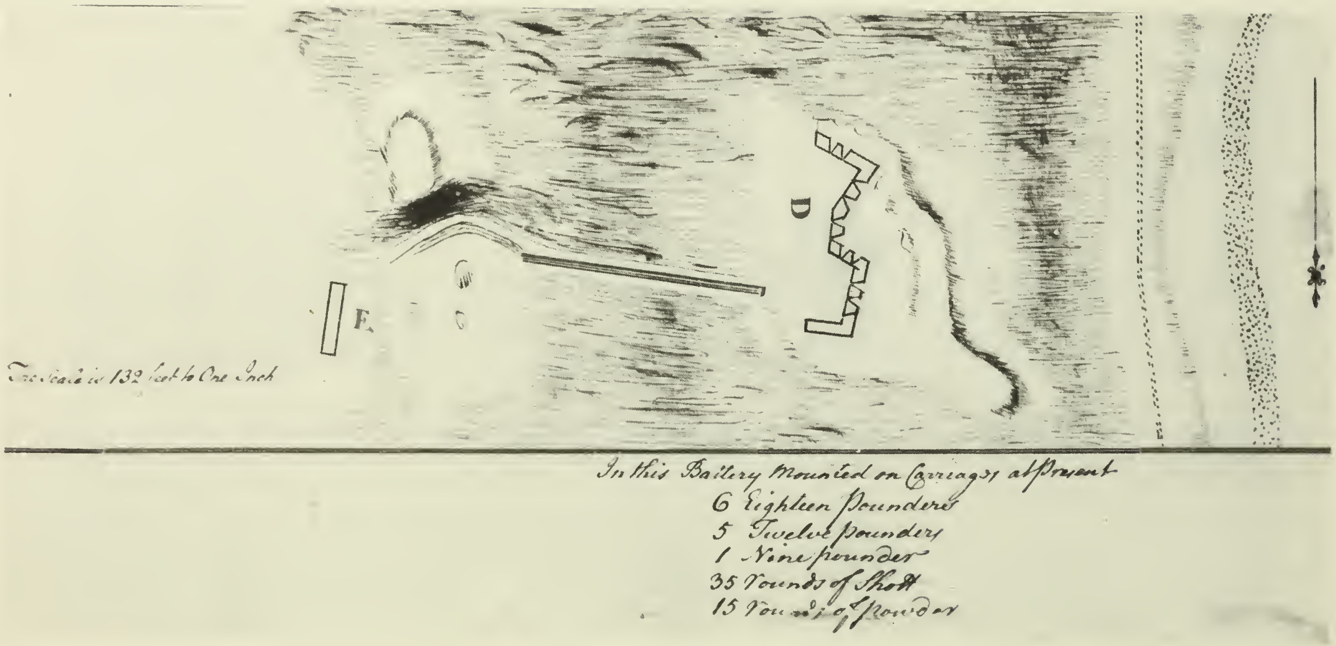


NEW LONDON, CONNECTICUT. *Richard Gridley prepared the following maps of American works in the New London area for Washington in May 1776.*

Record Group 360, National Archives



DETAIL OF ENTRENCHMENTS AT WINTHROP'S POINT



DETAIL OF A BATTERY AT GROTON (D)

Gridley had problems. Upon hearing from Boston near the end of April that the defenses laid out earlier were not complete, Washington exploded:

> Who am I to blame for this shameful Neglect, but you, sir, who was to have them executed? It is not an agreeable Task to be under the Necessity of putting any Gentn. in Mind of his Duty; but it is what I owe to the Public. I expect and desire, Sir, that you will exert yourself in compleating the Works with all possible Dispatch, and do not lay me under the disagreeable Necessity of writing to you again upon this subject.[23]

Believing that Washington had been misinformed by townspeople ignorant of military works, the engineer quickly countered with his own account of the state of Boston's defenses and of surveys conducted along the coast north of Boston—surveys Washington had ordered only a week before he reprimanded Gridley. In Gridley's view, Gloucester was "a place of Great Consequence to keep possession of," and he accordingly proposed a new fort to secure it. With obvious agitation he dismissed the criticism as the work of men who were apt "to Prate of things they don't understand," and who in many cases possessed "a Malignant, Deceitfull disposition."

11. "I HAVE EXERTED EVERY NERVE TO THE UTMOST"

Richard Gridley to George Washington.

Boston, May 13, 1776

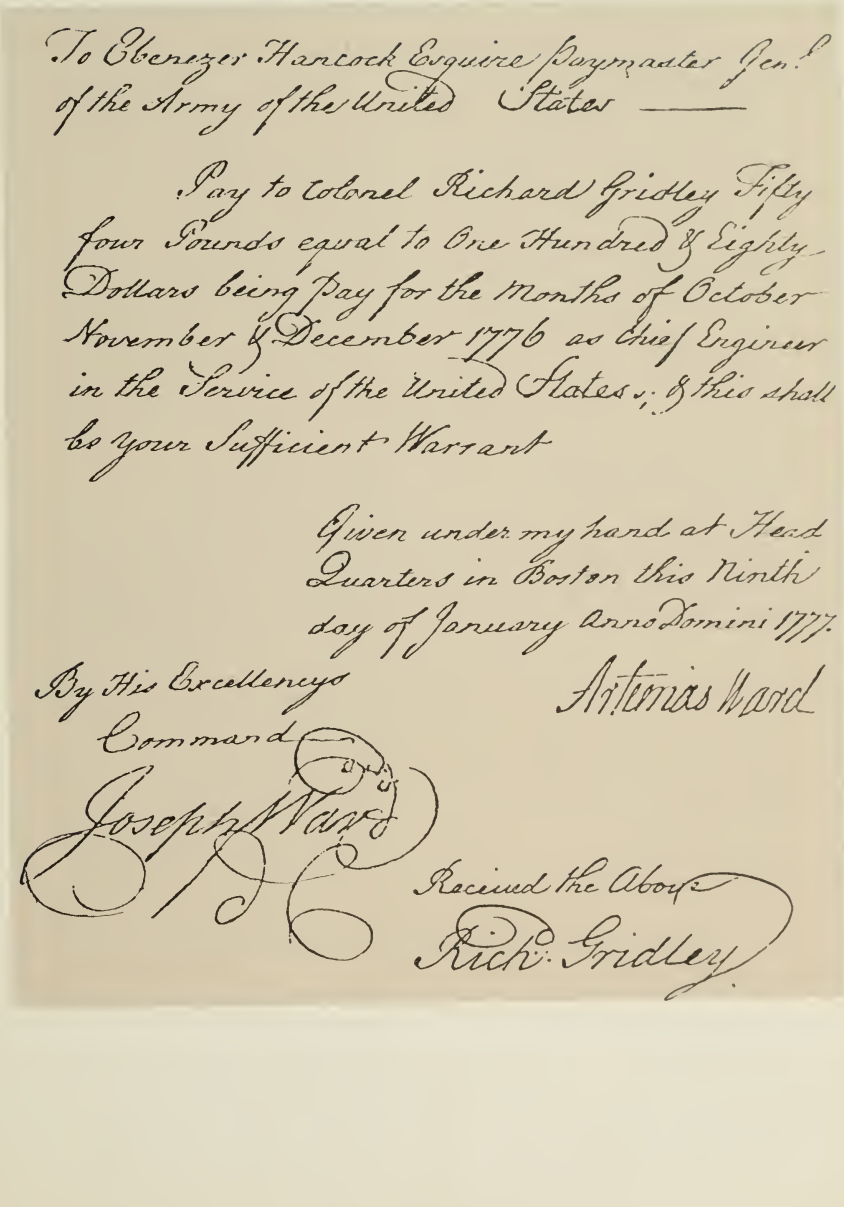
Sir:

I received your Excellencys Orders . . . and have agreeable thereto been to Cape Ann, and made a Critical Survey of the Same. The Plan that accompanys this, is a Survey made by Mr. Holland, which I Luckily met with, and have Examin'd in the Essential parts, and have added the Soundings and some Shoals which that plan had not and have been as Correct as the time woud permit; I have also sent plans of the Several Forts Erected at Glocester, which you'l please to Observe by the Red Letters referr'd to in the Plans; The Letter *H* which is at Mussel Point and is a Height well adapted for a Fort of Six Battering Cannon, which will greatly annoy any Ships coming into the Harbour, as they must come near it to avoid a Shoal, and the Battery being on such an Eminence, it cannot be hurt from the Ships Tops, and the Fort being only an Oblong Square Picketted, will be easily and gladly made by the Inhabitants, and can be easily Reinforc'd, or Retreat with Safety: In my opinion this Harbour is a place of Great Consequence to keep possession of—at present there is 250 Men to Guard it, but they are dispers'd from Squam Round the Cape to Glocester which is a Great Extent, and they cant Suddenly be collected together: They want Cannon Ammunition and men—Shoud there be an Alarm they cannot be assisted from any place nearer than Ipswich which is twelve Miles distance: They Inform me four hundred of their men are Inlisted into the Army, and very few remain fit for Services—Manchester Eight Miles on this side Glocester is without any Men or Fort, a Company of men and a Small Ridout (with three or four Cannon) made there at small Expence woud be the Safety of that place, which place being cutt off, woud greatly hinder the Communication with Cape Ann, as from that place to Beverly, there is Water enough for the whole navy of England to Anchor there: I have mentioned to several members of the court here, the necessity (in my Opinion) of their furnishing Glocester with Cannon and Men, as a Fleet is daily expected, and may do mischief before the Congress can have time to Act their pleasure from this Representation—Fort Hill and Dorchester Point Forts, Charles Town Fort and the Fort on Noddles Island [all in Boston] are now in a posture of Defence, with platforms Laid and Cannon Mounted on them, except Noddles Island which will soon be done: Three Cannon are Mounted on the Works at Castle William, and as soon as an Embrazure and platform can be finish'd, a cannon will be mounted; We shall be most Backward in the Laboratory way,[24] which I shall not be backward in hastning with all my Influence.—At Glocester I received your Excellencys Letter of 28 April, which Surpriz'd me at first, but when I consider'd the Fears of the people in General in this Town, their Ignorance of military Works, their aptness to Prate of things they don't understand, and in many of them a Malignant, Deceitfull disposition my surprise ceas'd: I know I have Exerted every Nerve to the utmost in my power to Forward the Works; the Soldiers have Complaind their Duty has been more Severe since the possession of Boston than before, for the whole were every day on Duty of Fatigue or Guard.—I have press'd the members of the Court and the Inhabitants of this Town to lend their assistance, and after some Consideration, have Effected their Aid: It is my strongest Inclination to forward every thing for the good of the Country Maugre the Insinuation of Detractors—I woud have sent Plans of the Forts here, but have not time at Present, as I must set forward this day for New London. . . .

—Papers of the Continental Congress, roll 95.

GRIDLEY PAY WARRANT. *When Richard Gridley became Chief Engineer in 1775, Congress set his pay at $60 per month. Subsequently, other engineer officers received the same pay, with assistant engineers receiving half that amount. As chief engineer for the Eastern Department at Boston, Gridley was still receiving the same pay when this warrant for three months' pay was issued in January 1777.*

Artemus Ward Papers, Massachusetts Historical Society



To Ebenezer Hancock Esquire Paymaster Genl
of the Army of the United States ——

Pay to Colonel Richard Gridley Fifty four Pounds equal to One Hundred & Eighty Dollars being Pay for the Months of October November & December 1776 as Chief Engineer in the Service of the United States; & this shall be your Sufficient Warrant

Given under my hand at Head
Quarters in Boston this Ninth
day of January Anno Domini 1777.

Artemas Ward

By His Excellencys
Command
Joseph Ward

Recieved the Above
Richd. Gridley

An account of lumber and nails provided by Congress for the Boston forts in the fall of 1776 reveals the scope of Gridley's effort to upgrade and maintain the town's defenses.

12. GRIDLEY'S ACCOUNT OF MATERIALS SUPPLIED TO THE BOSTON FORTS

Boston, November 1776

Fort-Hill, in Boston

4972 feet of Boards
5420 feet of 2-inch Plank
5175 feet of 4-inch Plank
2700 feet of Oak Plank
2700 feet of Pine Joist
10,167 feet of Pine Timber
1675 feet of Oak Joist
672 feet of Oak Timber
2100 Pickets
2527 lbs. of Spikes and Nails
Two buildings containing—
12 thousand Shingles
8206 feet of Boards
900 feet of Timber
1200 feet of Joist
8 thousand 10-penny Nails
12 thousand 4-penny Nails
½ thousand 20-penny Nails

No. 1. Fort at Dorchester Point

3454 feet of Oak Plank
2370 feet of Pine Timber
1600 Pickets
220 lbs. of Spikes
Two buildings containing—
650 feet of Timber
800 feet of Oak Joist
3070 feet of Boards
7½ thousand Shingles
7½ thousand 4-penny Nails
5 thousand 10-penny Nails
½ thousand 20-penny Nails

No. 2. Dorchester, second hill

3626 feet of Oak Plank
1130 feet of Pine Timber
200 feet of Pine Plank
1200 Pickets
160 lbs. Spikes
One building containing—
400 feet of Timber
500 feet of Joist
2250 feet of Boards
5½ thousand Shingles
5½ thousand 4-penny Nails
3 thousand 10-penny Nails

No. 3. Fort on Dorchester, southermost hill

2626 feet of Oak Plank
912 feet of Pine Timber
1100 Pickets
50 lbs. Spikes
Two buildings containing—
450 feet of Timber
600 feet of Joist
2320 feet of Boards
6 thousand Shingles
6 thousand 4-penny Nails
3 thousand 10-penny Nails
½ thousand 20-penny Nails

Fort at Noddle's Island

3650 feet of Oak Plank
1710 feet of Oak Timber
2150 feet of Pine Plank
1395 feet of Pine Timber
800 lbs. Spikes

Fort on Charlestown Hill

924 feet of Pine Timber
2592 feet of Oak Plank
400 lbs. of Spikes
A building containing—
    200 feet of Joist
    344 feet of Timber
1342 feet of Boards
3 thousand of Shingles
3 thousand 4-penny Nails
1½ thousand 10-penny Nails
½ thousand 20-penny Nails

Fort on Governour's Island

288 feet of Oak Plank
156 feet of Pine Timber
1000 Pickets
25 lbs. Spikes
For the Blockhouse, viz:
23 thousand Shingles
23 thousand 4-penny Nails
60 feet of Timber
750 feet of Boards
Painting the Blockhouse

—Force, *American Archives*, 5th ser., 3:476–77.

Two years after the British evacuation, Gridley continued work on Boston's defenses in anticipation of an enemy attack. Convinced that the fortifications he had begun at Castle William and on Governor's Island should be finished speedily in order to close the lines around Boston, he begged for more men, equipment, and supplies. Noting that many Bostonians would be ready to blame him for every misfortune, he strongly defended his earlier labors: "I have hitherto done every thing in my power to forward the works . . . . I coud not do more . . . for want of Workmen."[25]

When the British, now bolstered by a fleet superior to the French one, threatened Boston in September 1778, the Army's Chief Engineer, Brig. Gen. Louis Lebègue Duportail, conceived a plan to stop them. While attempting to prevent redcoats from leaving New York City, the Continentals, he said, should fortify the main route to Boston and cut off all detours and parallel routes. Duportail advised Washington to send him to Boston so that all necessary measures could be taken for the city's defense.[26]

Washington followed Duportail's advice. On September 29 he ordered his Chief Engineer to Boston to examine the existing fortifications as well as those under construction and to "form a plan, from a view of the whole local situation of the place, . . . best calculated to give . . . the most effectual security." The Commander in Chief could not resist offering his own suggestions:

> Without intention to lay any restraint which may contradict your own Judgments, I will barely hint my desire in general, that the works may not be to extensive with a view of embracing any considerable part of the bay, the heights of Dorchester which immediately command the town, will strike you as an object of the first attention, and the possession of them as indispensable; the occupying them, Roxbury heights and such ground as may cover the inner bason with works capable of obstinate defence will, together with the fortifications of the harbour secure the Town and French Squadron, till the arrival of this Army.[27]

On October 6 Duportail surveyed the works; and on his advice—in Maj. Gen. William Heath's words—"fatigue parties were employed on the different works, and every thing put in the best posture of defence."[28]

Chapter IV

THE WAR IN THE NORTH: TICONDEROGA TO SARATOGA, 1775–1777

At dawn on 10 May 1775, three weeks after the battles of Lexington and Concord, eighty-three Massachusetts and Connecticut volunteers and Green Mountain Boys, led by Ethan Allen and Benedict Arnold, ferried two miles across Lake Champlain and conducted a surprise raid on Fort Ticonderoga. The fort held valuable military stores—particularly artillery—desperately needed by the Continental Army outside Boston. High winds and a driving rain had made the crossing perilous; but on orders from Arnold the raiders took up their weapons, penetrated the fort's crumbling south wall, and entered the parade ground. With dramatic flair Allen reputedly demanded the fort's surrender "in the name of the great Jehovah and the Continental Congress." After offering only token resistance, the British commander complied.

Without delay the Continental Congress voted to evacuate the military stores and then abandon Ticonderoga and nearby Crown Point, which the Americans had also taken. In the northern colonies a violent outcry greeted the news. As a result Congress reversed its decision. Ticonderoga became the main garrison for the Northern Department of the Army, organized in late June under the command of Maj. Gen. Philip J. Schuyler. Because of its strategic location on the pathway to Canada, the fort became the base for Schuyler's abortive invasion of Canada in late summer 1775.

In November Washington sent Col. Henry Knox, commander of the Continental artillery, from Boston to get Ticonderoga's big guns. Knox spearheaded a heroic effort: before the end of January 1776 eighty yoke of oxen had dragged sixty cannon and mortars 300 treacherous snow- and ice-covered miles to the rebel lines outside Boston.

Removal of the captured artillery stores did not signal the end of Ticonderoga's value to the Americans. The British turned back the rebel invasion of Canada, and by early July 1776 survivors of the campaign began to arrive back at Crown Point in need of food, housing, and medical attention. The works at Crown Point were in ruins, so attention turned to Ticonderoga, several miles south.

Efforts to expand the fort's facilities and strengthen its defenses began immediately. During the next twelve months the patriots repaired the main

JOHN TRUMBULL. *Trumbull (1756–1843), a staff officer whose artistic talents led to service as an assistant engineer at Boston and Ticonderoga, painted this self-portrait in 1777.*
Museum of Fine Arts, Boston

fortress, improved the outer lines built earlier by the French, and constructed redoubts, blockhouses, and a bridge and boom across Lake Champlain. However, the most significant change was the fortification for the first time of a height southeast of Ticonderoga across Lake Champlain known later as Mount Independence.

During the American occupation of Ticonderoga, John Trumbull, Jeduthan Baldwin, Christopher Pelissier, and Thaddeus Kosciuszko served as engineers. Baldwin was the fort's chief engineer, Pelissier the second-ranking engineer. From time to time assistant engineers taken from the line aided them. A scarcity of rations, equipment, and clothing, combined with the problems of disease, hostile Indians, and adverse weather, made assignment to Ticonderoga a genuine hardship.

When he arrived at Fort Ticonderoga in July 1776, Colonel Trumbull had just been appointed deputy to Maj. Gen. Horatio Gates, General George Washington's adjutant general. Trumbull's account of his tour of duty at Ticonderoga, where he remained until late that year, included a description of the initial occupation of Mount Independence and details of the debate over fortifying nearby Sugar Loaf Hill (later renamed Mount Defiance by the British).

Trumbull, the future artist, claimed credit for first recognizing that Sugar Loaf Hill presented a substantial threat to Ticonderoga. As he recounted years later in the passage from his autobiography below, Trumbull contended—and demonstrated—that not only was the American position within firing range of the mount, but also the summit could be reached and fortified. Even the lame General Arnold joined him in climbing the hill's steep eastern slope!

Further, Trumbull cogently argued that an adequate defense of Ticonderoga and Mount Independence would require ten thousand men and great expense; on the other hand, a permanent work on the summit of Sugar Loaf Hill would sharply reduce overall expense and manpower requirements.

Still adhering to his belief that Sugar Loaf Hill could not be scaled, and hence could not be fortified, Schuyler rejected Trumbull's arguments. Thus, fortification of the Ticonderoga–Mount Independence complex went forward under the shadow of still-undefended Sugar Loaf Hill. A year later the rebels would have cause to regret this missed opportunity.

1. "THE ASCENT *WAS* DIFFICULT AND LABORIOUS, BUT NOT IMPRACTICABLE"

From John Trumbull's autobiography.

My first duty [July 1776] was, in company with Colonel Wayne,[1] to make a second examination of Mount Independence. He joined in the opinion . . . that the ground was finely adapted for a military post. At the northern point, it ran low into the lake, offering a good landing place; from thence the land rose to an almost level plateau, elevated from fifty to seventy-five feet above the lake, and surrounded, on three sides, by a natural wall of rock, every where steep, and sometimes an absolute precipice sinking to the lake. On the fourth and eastern side of the position ran a morass and deep creek at the foot of the rock, which strengthened that front, leaving room only, by an easy descent, for a road to the east, and to the landing from the southern end of the lake. We found plentiful springs of good water, at the foot of the rock. The whole was covered with primeval forest. . . .

Part of the troops, as they arrived from Crown Point, being ordered to land and take post on this spot, proceeded to clear away the wood, and to encamp. The exhalations from the earth, which was now, for the first time, exposed to the rays of a midsummer sun, combined with the fog which rose from the pestilent lake, soon produced sickness in a new shape—a fever very nearly resembling the yellow fever of the present time—and it was not unusual to see the strongest men carried off by it in two or three days. The four Pennsylvania regiments, the *elite* of the army, were posted in the old French lines, which they were ordered to repair; and at all points the troops were actively employed in strengthening old works of defense, or in constructing new ones.

In the mean time, reinforcements were earnestly solicited from the New England states, and promptly sent on, so that the post soon assumed the aspect of military strength and activity. . . .

The position of the army extended from Mount Independence on the right and east side of the lake, to the old French lines on the west forming our left, protected at various points by redoubts and batteries, on which were mounted more than a hundred pieces of heavy cannon. After some time, it was seen that the extreme left was weak and might easily be turned; a post was therefore established on an eminence, near half a mile in advance of the old French lines, which was called Mount Hope. Thus our entire position formed an extensive crescent, of which the center was a lofty eminence, called Mount Defiance, the termination of that mountain ridge which separates Lake George from Lake Champlain, and which rises precipitously from the waters of the latter to a height of six hundred feet. The outlet of Lake George enters Champlain at the foot of this eminence, and separates it from the old French fort and lines of Ticonderoga. This important position had hitherto been neglected by the engineers of all parties, French, English and American.

I had for some time, regarded this eminence as completely overruling our entire position. It was said, indeed, to be at too great a distance to be dangerous; but by repeated observation I had satisfied my mind that the distance was by no means so great as was generally supposed, and at length, at the table of Gen. Gates, where the principal officers of the army were present, I ventured to advance the new and heretical opinion, that our position was bad and untenable, as being overlooked in all its parts by this hill. I was ridiculed for advancing such an extravagant idea. I persisted however, and as the truth could not be ascertained by argument, by theory, or by ridicule, I requested and obtained the general's permission to ascertain it by experiment. General (then Major) Stevens[2] was busy at the north point of Mount Independence in examining and proving cannon; I went over to him on the following morning, and selected a long double fortified French brass gun, (a twelve pounder,) which was loaded with the proof charge of best powder and double shotted. When I desired him to elevate this gun so that it should point at the summit of Mount Defiance, he looked surprised, and gave his opinion that the shot would not cross the lake. "That is what I wish to ascertain, Major," was my answer; "I believe they will, and you will direct your men to look sharp, and we too will keep a good look-out; if the shot drop in the lake their splash will easily be seen; if, as I expect, they reach the hill, we shall know it by the dust of the impression which they will make upon its rocky face." The gun was fired, and the shot were plainly seen to strike at more than half the height of the hill. I returned to head-quarters and made my triumphant report, and after dinner requested the general and officers who were with him to walk out upon the glacis of the old French fort, where I had ordered a common six pound field gun to be placed in readiness. This was, in their presence, loaded with the ordinary charge, pointed at the top of the hill, and when fired, it was seen that the shot struck near the summit. Thus the truth of the new doctrine was demonstrated; but still it was insisted upon, that this summit was inaccessible to an enemy. This also I denied, and again resorted to experiment. Gen. Arnold, Col. Wayne, and several other active officers, accompanied me in the general's barge, which landed us at the foot of the hill, where it was most precipitous and rocky, and we clambered to the summit in a short time. The ascent *was* difficult and laborious, but not impracticable, and when we looked down upon the outlet of Lake George, it was obvious to all, that there could be no difficulty in driving up a loaded carriage.

Our present position required at least ten thousand men, and an hundred pieces of artillery, for its doubtful security. I assumed that it would be found impossible for the government, in future campaigns, to devote so great a force to the maintenance of a single post; and as there was no road on either side of the lake by which an enemy could penetrate into the country south, he must necessarily make use of this route by water; and as the summit of Mount Defiance looked down upon, and completely commanded the narrow parts of both the lakes, a small but strong post there, commanded by an officer who would maintain it to the last extremity, would be a more effectual and essentially a less expensive defense of this pass, than all our present extended lines.

On these principles I proceeded to draw up two memoirs, in one of which was stated the number of men, *ten thousand,* with the expense of their pay, subsistence, clothing, etc., and of artillery at least *one hundred* pieces, with their attirail [attire], ammunition, etc., necessary to the maintenance of the present system of defense; in the other, an estimate of the expense of erecting a permanent work on the summit in question, large enough to contain a garrison of five hundred men, and mounting twenty five heavy guns, with the ammunition, pay and provisions for that force for one year. The relative expense of the two systems was as twenty to one nearly. These memoirs I accompanied with plans of our present position.

—Trumbull, *Autobiography,* pp. 29–34.

Lt. Col. Jeduthan Baldwin joined Trumbull at Ticonderoga in July 1776. After having served as an assistant engineer with the rank of captain in Boston and New York earlier that year, Baldwin had received a promotion and orders to go to Canada. However, by the time he reached Quebec Province in mid-May he encountered the retreating American army. Baldwin joined the slow trek back down Lake Champlain and along with countless others suffered from smallpox on the way. On July 8, when he arrived at Ticonderoga, he became the fort's chief engineer, and hastily took on the tasks of laying out defenses, adding buildings, and overseeing scores of artisans. Like most serving in the Ticonderoga wilderness, Baldwin experienced his share of hardship and illness. On 3 September 1776 Congress rewarded him with a promotion to colonel and pay of $60 per month.[3]

Excerpts from Baldwin's daily account of his experiences at Ticonderoga reveal his tremendous responsibilities, particularly in regard to the artisans, whose accomplishments included saltpeter factories and soap works.[4]

2. "I HAVE MY HANDS AND MIND CONSTANTLY EMPLOYED NIGHT AND DAY EXCEPT WHEN I AM ASLEEP AND THEN SOMETIMES I DREAM"

From Jeduthan Baldwin's journal.

7 [July 1776]. Recd. orders to go to Ticondaroga with Som Carpenters and to cary all my Baggage, I collected all the Intrenching tools togeather.

BALDWIN'S JOURNAL. *Jeduthan Baldwin (1732–88), chief engineer at Ticonderoga, kept a detailed journal. This facsimile is of an entry for 28 October 1776.*
Baldwin, *Journal*

Ticonderoga Octobr 28. 1776

This morning I viſited the workmen as Usu Usual and came in to breakfaſt about 8. while I was at breakfaſt, the alaram Gun was fired. about 9. O.clock 4 boats hove in sight. at 3 milepoint. one of the boats of the enemy Sounded the Channel with in a Mile of our Battery at 11.o.C we gave them a few shot. made them stall off again. about 17 boats Row about in sight till Sun an hour high & then they all went of—

3 Regts came over from Independant point the 2 Regts at the Mills. & at the landing was orderd in. but soon after were Counter orderd.

(29 all was clear no appearance of the Enemy finiſhed the bridge a croſs the Lake to Independant point so that men could paſs

30. all was in peace Capt. Dow & Mr. Adams dind with me— Visited my workmen as Usual

31. nothing material happined. I dind with Col. Hartley Col. Waine Dr. Canada & Dr. Johnson

Novr 1. Col. Daton came in with his Regt & a Deserter. from Crown Point. & says that

*8.*Went to Ticonderoga, with Genl. Schuyler and Genl. Gates, Viewd the grounds on the East Side ye Lake with Col. Trumball on one Hill, took 26 Carpenters with me to repair ye Vessels and the Saw mill at Skeensboro.

9. Viewd the Grounds on the east with Genl. Schuyler and Genl. Gates, round the peninsula, found Water by dig̀ing on the top of the Hill. . . .

10. Went over and Marked out a road from the North point to the top of the Hill with Col. Wain [Wayne] and Col. Trumball. Genl. Sullivan[5] Reconoiterd the Hill with me. I went up East Creek to the Head about 6 miles, a muddy bottom.

11. Went over to the point with 200 Men to Clear a road, Dig well, etc. It was a Very rainey Day. We returnd about 12 o'clock to camp, Very wet. . . .

18. Visited all my workmen as Usual but found many of them Sick and great complaints of the want of provision, yt they had only 12 ouz. of pork and 1 1/2 lb of Flower pr Day.

19. A Very Heavey Rain last night and continewd the chief of the Day. 2 men of Col. [John Philip] De Haas Regt. were found in there tents drownded in warter, many others lay half coverd or Set up all night. Such a heavey Rain is sildom known. This Day by Genl. Gates order I Recd 98 Dollars which will enable me to purchase Cloathing, if I can find them, but they are very scarce and deer. . . .

23. Laid out the park for the artillery on Rattlesnake Hill, bought Carpenters tools of Six men and then discharged them.

24. Dind with Genl. Gates, and in the afternoon we went round the old French lines with Col. De Haws, which our people were at work Very fast.

25. Genl. Gates and several other Officers went over to the point with me and highly approvd of the works that I had laid out there, and ordered that 220 men Should work daily at least and as many more as could be imployed and was in high good humor. . . .

26. . . . This Day there is a supply of fresh provision, and it is ordered that all the troops shall have 4 days fresh and 3 Days Salt meat a week.

27. Went over to the East point with Genl. Arnold and Col. Trumball. We orderd the encampment of the Briggade to be alterd. Recd. 200 Dollars to pay for Tools, by order of the Genl. . . .

28. This morning I visited all the Artifficers before breakfast as Usual. I paid . . . 212 Dollars for Carpenters tools as there is no Quartermaster Genl. at present with this army, I have that duty to do in part, and I have the intire direction of all the House and Ship Carpenters, the Smiths, Armourers, Roap makers, the Wheel and Carriage makers, Miners Turners, Coalyers, Sawyers and Shingle makers, which are all togeather 286, besides the direction of all the fateagueing parties, so that I have my hands and mind constantly employed night and Day except when I am a Sleep and then sometimes I dream. . . .

30. At Ticonderoga and lodg in the Redoubt East of the Garrison in the point of Rocks, but as my business calls I am on Mount Independancy some Days 2 or 3 times in the Day as was the case this Day. . . .

[August] 10. This Day the paymaster Genl. dind with me and the Commisery Genl. with several other Gent. Made up the pay roll for the artifficers of all Trades.

11. Went over to Independant point with Genl. Gates and Arnold to view the works. They exprest entire satisfaction. In the afterNoon I Recd. (by a warrant from the genl.) 1262 Dollars to pay the artifficers under my care. . . .

14. Laid out a redoubt on Independant Mount, which Genl. Gates and others aprovd. of. . . .

15. Raised the Labratory. Laid out and began 2 Ridoubts on the North end of the old french lines in the afternoon.

16. Laid out a Redoubt on the North side of the point . . . .

17. Laid out a wharf at the South side of Independant point and orderd a large Stoer House to be built and also 2 guard housen and then I returned with Col. Wain and Col. Trumball, went into the woods near the Saw mill by a Spring where we had a fine dinner, Venison roasted on Sticks Indian fashon, an Elegant Entertainment. . . .

[September] 7. All hands at work at Daylight prepairing our batteries against the worst.

8. I was Very poorly this Morning as I had been yesterday and last Night I Took Camphire that made me Swet all night, this morning took a portion Rubarb that workt very kindly. In the afternoon I went out to Col. Brewers and Willards Encampments and laid out a fort on the Top of the Mount, North of the Mills. . . .

9. I was Very porly with Hard pain in my head and Eyes. At Evning took a Vomit that workt well but kept me up part of the night. . . .

10. Was so Sick that I did not go abroad, pain in my head across my Eyes and in my Stomach and Sick at the Stomach but could get nothing to take and so woried the Day thro. . . .

11. Paying of my workmen. . . . I had a Severe fit of Ague and fever that lasted 9 hours. About Sunset I took a Vomit that workt well and gave Some Relief, but very faint and weak. . . .

15. This Day I misst. having the ague, but was so faint that I can hardly walk, my stomack loathing all kinds of food, a little wine and water or Wine Whey being the chief of what I have taken Since Last Sabath Day. I am much better this evning but far from being well.

16. Was somthing better and it is of the Lords mercy that I am alive after Such a hard and constant fatigue being out Early and late Crossing the water in the thick Fogs, that are peculiar at this place.

17. . . . I was better but no relish for food. Began to repair my Redoubt. . . .

19. Took physick, I broak out all over Very full which burnt and is Very tedious to bair, but it is probible this may be of great Service for I have been better 4 Days from the time I broak out with this Rash.

20. Went a broad a little, but still unwell.

21. Was poorly, went a broad but little. Majr. Hay Came home, has been down the Lake 45 Miles, brought up a plenty of Sauce for our Mess. He Says that 3/4 of all the Inhabitants in this country are Sick, such a time has not been known before.

22. I took physic, was better a good deal, feel well to what I have been. . . .

Octor 1. Went over to the point with Col. Pallaceer[6][Pelissier] to Lay out the fort. We Run Round the work but did not finish. . . .

2. Went with Col. Pallaseer, Capt. Newland and Lt. Dallace over to Independant Hill leying out the Fort agreable to a New Plan I had drawn, the Several Assistant Engineers Dind with me. I Supt. [supped] with G. Gates.

—Baldwin, *Revolutionary Journal,* pp. 58–66, 70, 74–76, 78.

Besides strengthening the garrison and its defenses, the artisans helped ready a fleet intended to beat back the British on Lake Champlain. In October 1776 a full-scale encounter finally took place on the lake off Valcour Island. Although the British survived and the rebel fleet was destroyed, the season was too advanced for the enemy to attempt a move against Ticonderoga before spring.

On October 20 Baldwin got Gates's approval to build a bridge across Lake Champlain from Ticonderoga to Mount Independence. Immediately he set to work on a boom and by the 29th the bridge was finished "so that men could pass."

General Gates's orders for 1776 recorded by Col. Anthony Wayne, Baldwin's commander, illustrate further the Chief engineer's role at Ticonderoga. Baldwin directed fatigue parties and artisans, was responsible for maintaining tools in readiness, and surveyed campsites and redoubts.

3. "THE GENERAL IS CONFIDANT A SPIRIT OF EMULATION WILL ANIMATE EACH BRIGADE TO FINISH THE TASK ASSIGN'D THEM"

From Anthony Wayne's orderly book.

10 July 1776. Two captains, six subalterns, eight serjeants, eight corporals, two drums, and one hundred and ninety two privates to parade tomorrow morning at eight oclock, to go on fatigue under the direction of Lieutenant Colonel Baldwin, Chief Engineer. . . .

11 July 1776. . . . Lieutenant Beal with the house carpenters and Mr. Noah Nichols with the wheelwrights, are to remain at Ticonderoga, under the direction of Colonel Baldwin, Chief Engineer. . . .

13 July 1776. Lieutenant Colonel Baldwin will draw provision twice a week, for all the artificers and take the whole under his direction. . . .

14 July 1776. The chief engineer to order the artificers to get proper necessary's made over the rock opposite their hutts, that the new encampment may be kept clean against the troops arrival. . . .

19 July 1776. The Chief Engineer is to get all the wood axes helv'd and ground immediately that they may be ready for use when the weather clears up. . . .

21 July 1776. As the Chief Engineer will have a sufficient number of felling axes ready to employ a large body of men tomorrow, the General desires the commanding officers of the three eldest brigades will send as many men as can be sent from those off duty to clear the ground for the incampment of those brigades. . . .

22 July 1776. The Chief Engineer Colonel Baldwin will order that the soap deliv'd to the artificers be divided properly between them. . . .

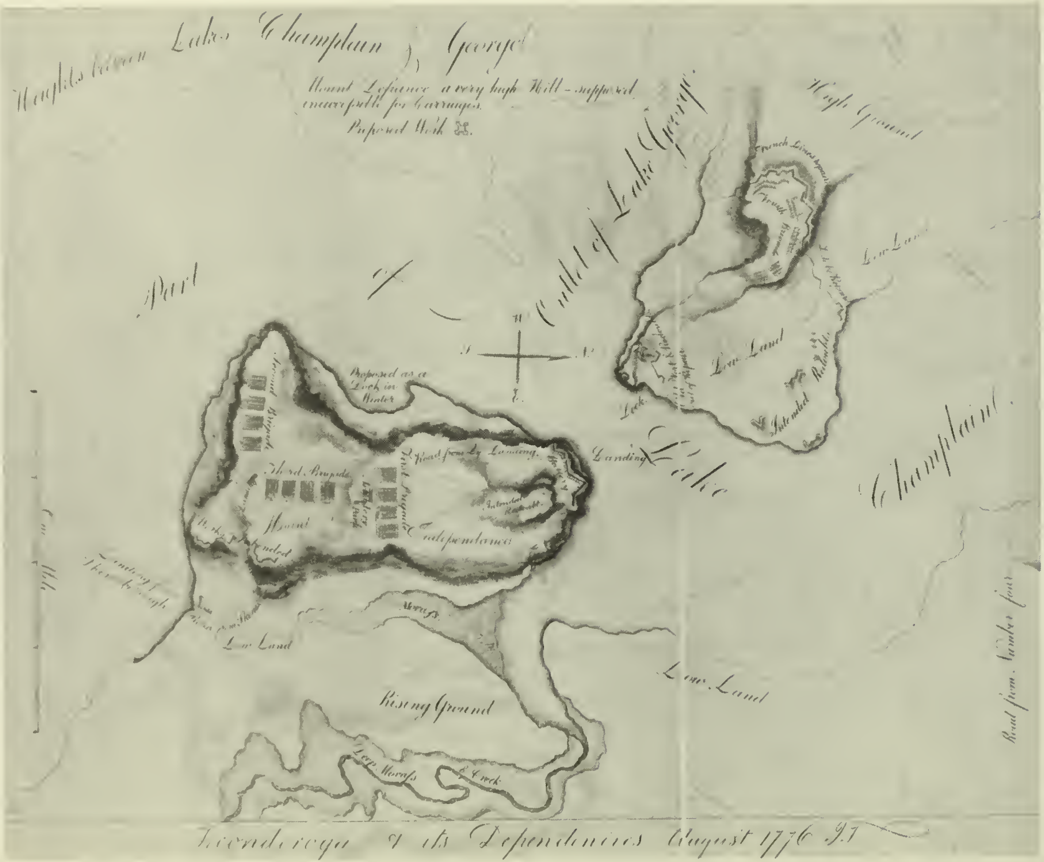
27 July 1776. The commanding officers of regiments the Commanding Officer of Artillery and the Chief Engineer will be very exact in obliging their respective surgeons to make an immediate report of every person infected with small pox. . . .

28 July 1776. The comissary will issue eight pounds of soap to every hundred men pr week now in this camp upon a proper sign'd return being deliv'd to him by the commanding officer of each corps. The Commanding Officer of Artillery and Chief Engineer for the Artificers to draw in proportion to their numbers. . . .

30 July 1776. The General is exceedingly astonish'd and concern'd to find such a supineness and indolence previling in the 3 brigades station'd upon Mount Independance, as if it was a time of profound peace and no enemy to contend with, he is therefore oblig'd to represent to B. G. [Benedict] Arnold, and the colonels commanding brigades and to every commanding officer of a regiment belonging to those brigades how necessary it is for them in the present emergency for them by their authority and example to inspire all under them with a spirit of emulation in forwarding the works, clearing the ground and preparing to receive the enemy, the troops upon the Mount should be convinc'd by their last year's campaigne at Cambridge of the utility of good works; the General trusts they will loose no time in raising them.

Colonel Baldwin will this day acquaint the commanding officer of each brigade with the work expected to be done by that brigade, and the General is confidant a spirit of emulation will animate each brigade to finish the task assign'd them. . . .

The fatigue parts for the future are to begin work at 6 oclock and have their breakfast before they begin.


Heights between Lakes Champlain & George
Mount Defiance a very high Hill - supposed inaccessible for Carriages.
Proposed Work
High Ground
Outlet of Lake George
Part of
W
S
N
E
French Lines repaired
Low Land
Low Land
Intended Redoubts
Intended
Lock
Landing
Lake
Champlain.
Proposed as a Lock in Winter
Second Brigade
Third Brigade
First Brigade
Artillery Park
Road from ye Landing.
Battery
Intended Redoubt
Mount Independance
Morass
Low Land
Low Land
Rising Ground
Deep Morass
Creek
Road from Number four
One Mile
Ticonderoga & its Dependencies August 1776 J.T

They will be dismiss'd at twelve oclock for dinner till one oclock then work till seven. . . .

31 July 1776. Lieutenant W. Augustus Patterson of Colonel Pattersons regt. is appinted an assistant engineer to Colonel Baldwin and is to be obey'd as such. . . .

16 Aug 1776. The Cheif Engineer to see that all the spades and axes in store are immediately helv'd, and a party are constantly kept grinding of axes. . . .

17 Aug 1776. The Cheif Engineer, to deliver 15 axes to the field officer, of the main guard tomorrow morning at guard mounting, they are to be answerable for those axes, to the officers who reteire them, and those guards are not to be relieved, until the axes are in good order deliver'd to the releiving officers. . . .

24 Aug 1776. The Cheif Engineer with Col. St. Clair and Col. Wayne will tomorrow morning at 10 oclock take a review of the ground near the saw mill fix upon a spott for the encampment of two continental regts. and the best situation for throwing up a redoubt to command the pass. The D. A. G. and Deputy Quarter Master Genl. will also attend Col. Baldwin. . . .

28 Aug 1776. During the recess from work occasion'd by the rain the cheif engineer will order as many axes to be ground as possible as soon as the weather clears up. The commanding officer of each regt may receive from Col Baldwin 24 axes giveing his receipt for the same. Those axes are to be distributed to three of the most expert axmen in each company who are to keep them constantly in good order and to be ready to turn out when call'd for. . . .

29 Aug 1776. The cheif engineer, will order the broken hand barrows to be repai'd and as many new ones made, as are immediately wanted. . . .

2 Sept 1776. All the spades, pickaxes, and billhooks now in possession of the respective regts (except a spade and pickax to each regt) are to be immediately brought to the Chief Engineer. Those on mount Independance are to be brought to the landing, those on the West side to Head Quarters. . . .

4 Sept 1776. . . . Major Pail of Col Wheelocks Regt. Leiut Ashbeldelis of Col Winds Regt and Ensign Perold of Col Maxwell's Regt are joynd Assistant Engineers under Cheif Engineer Col Baldwin. . . .

6 Sept 1776. A return of all the axes spades pick axes shovels billhooks and hoes remaining in store to be deliver'd to the Qr M G. at 6 Oclock this

TICONDEROGA DEFENSES. *John Trumbull drew this map to show existing and projected works at Ticonderoga and Mount Independence as of August 1776. Note the fortification proposed for Mount Defiance (Sugar Loaf Hill),* top center.

Trumbull, *Autobiography*

evening. The commanding officers of regts will take notice that the fauling axes lately deliver'd to their respective troops are to be return'd when call'd for, and such as are dificient must be paid for, by a stoppage out of the regimental abstracts. As a considerable body of troops will joyn the army this week, the Cheif Engineer must take care to provide intrenshing tools sufficient to employ all the working parties. . . .

28 Sept 1776. Mr. Christopher Joseph Delezenne is appointed an Assistant Engineer under Col. Baldwin, he is to be obey'd as such.

—Bulletin of the Fort Ticonderoga Museum,* 11:94–188 *passim. Courtesy of Fort Ticonderoga, Ticonderoga, New York.

Like Baldwin, Christopher Pelissier arrived at Ticonderoga that summer. A native of France, he had assisted the American cause in Canada by supplying shells and cannonballs. Forced to abandon his Canadian operation after the American defeat, Pelissier applied to Congress for aid. His reward was an appointment as engineer lieutenant colonel on 29 July 1776. Pelissier went to Ticonderoga as Baldwin's subordinate.

In October 1776, as the British threatened to push down Lake Champlain and take Ticonderoga, Pelissier scrutinized the Jersey Redoubt, one of the fort's new outworks. He found it to be technically inferior, largely because the enemy could not be enfiladed from the salient angle on the north side and because there was insufficient maneuvering room inside for the troops. What was needed was a second, covering redoubt. In his report on the works, Pelissier, whose engineer training is unknown, exhibited a fairly high degree of technical sophistication, particularly in comparison with Baldwin.

4. PELISSIER'S OBSERVATIONS ON THE JERSEY REDOUBT

October 21, 1776

It is highly probable that the enemy will attack that redoubt at the salient angle on the north side, for the following reasons:

Firstly. Their column cannot be enfiladed from that angle.

Secondly. Their left, bearing on the water side, cannot be galled on that quarter.

Thirdly. That angle is not at all defended.

It is true the next redoubt may fire a little on the right of the column of the enemy, but nothing stops a column which is not enfiladed.

It is evident that a column cannot be enfiladed from that acute angle, and that, therefore, the column will succeed. The enemy may then form a lodgment in the ditch without being seen either by the guard in the redoubt, the flanks of which are not defended, or by the next redoubt. And even though they should be seen from that redoubt, we could not fire upon them from that without running an imminent danger of firing upon ourselves. In this case the enemy have two ways left of carrying the redoubt: 1st. They can blow up that angle by opening a gallery under it. 2dly. By storming it, in which last case every thing will be in their favour. 1st. They may, unseen, destroy the fraises. 2d. The interiour epaulement, which is now making within the redoubt, is an insuperable obstacle to the continual fire which might be made for preventing its being carried; for now there is no sufficient room left between that epaulement and the banquette of the parapet. But even though there should be no epaulement, there is not room enough between the banquette and the platform of those guns which fire on the water; so that the troops within cannot perform their manoeuvres.

I judge, therefore, that if the redoubt be attacked it will be at that acute angle, and that if attacked it must be carried, unless another redoubt should be made to cover it. And this last redoubt ought to be strong enough not to be itself carried by the enemy, for it cannot be too much remarked that the *Jersey* redoubt on account of its too acute angle, cannot defend it. . . .

—Force, *American Archives*, 5th ser., 2:1970.

To attract artisans to the New York wilderness, the wages offered had to be high. For example, the company of carpenters who concluded the following agreement with Baldwin in December 1776 were to receive between eight and twelve shillings pay, one and one-half ration, and a gill of rum per day. At that rate, the top-paid craftsman made sixty shillings or £3 per week, between $7 and $8 in New York currency. Such benefits for the artisans often led to friction with Army regulars who were paid considerably less.[7]

5. AGREEMENT BETWEEN BALDWIN AND A COMPANY OF ARTIFICERS

Head-Quarters, Albany, December 16th, 1776

Memorandum of agreement made and entered into this sixteenth day of December, 1776, between Colonel Jedu'n Baldwin, Chief Engineer on the Northern Department, of the first part, and Mr. Jedi'h Thayer, of the State of the Massachusetts-Bay, Gentleman, and Mr. Nathaniel Emerson and the persons whose names are hereunto subscribed, and seals affixed, of the second part, all good workmen at the carpenter's business, to the number of sixty men; the said parties of the second part, each for himself, promises and agrees that they will immediately repair to such place as the said Colonel Baldwin shall direct, and there employ themselves in constructing such works or buildings as the said Engineer shall order.

That each of the parties of the second part shall, during the time he shall be in the publick employ conformable to these resolutions, each day continue at their said work and employment not less than ten hours.

That if any of the said parties of the second part shall leave the said work, or go from the post where they shall be employed, the leave of the said Colonel Baldwin, or the commanding officer of the post where he shall be so employed, being first obtained, he or they so going off shall forfeit all the wages that shall be due to them on account of their service performed in consequence of this agreement.

In consideration whereof, the said Jedu'n Baldwin, Engineer, promises and agrees, that the said Jedi'h Thayer shall have and receive twelve shillings per day, and Nathaniel Emerson ten shillings per day, and every other of the said parties of the second part the sum of eight shillings per day, New-York currency, for every day that they shall be in actual employment. That over and above that sum, the said parties of the second part shall severally receive one and a half ration of provisions and one gill of rum per day. That the said wages shall commence from the time the said parties of the second part shall respectively leave their usual places of abode, allowing at the rate of one dollar for every twenty miles travel. And the said parties of the first and second part do hereby agree with each other, that if any of the said parties of the second part is taken sick during the time which they shall be employed as above, the person so taken sick shall not be entitled to wages for the time he absents from working by reason of sickness, unless the said Colonel Baldwin, or the commanding officer of the post where they shall be so stationed, shall, on application to him made, refuse to discharge them, and then they shall be entitled to wages from the time of such refusal. . . .

—Force, *American Archives,* 5th ser., 3:1250.

In December 1776 the rebels expected a renewed attempt on Ticonderoga. In a memorandum the chief engineer proposed changes in the fort's defenses and estimated the supplies needed for the coming year. The large amount of materials requested underscores the great commitment made at Ticonderoga. Baldwin appeared anxious to get to work before spring; but as always, manpower was the deciding factor.

6. BALDWIN REVIEWS TICONDEROGA'S NEEDS FOR 1777

December 1776

Memorandum of sundry Articles that may be necessary to carry on the Works in the Northern Army in the Year 1777:

A,[8] 2,000 Iron Spades
A, 2,000 Iron Shovels
A, 3,000 Felling axes
A, 500 pick-axes
A, 1,000 Bill-hooks
A, 200 stone Hammers
A, 200 Masons Trowels
A, 20 Crow bars
300 Broad axes
50 Iron Squares
100 pair of Compasses
100 pair of Framing Chisels
A, 400,000 Feet of Inch pine Board
A, A large Quantity of plank and Timber for Gun Carriages
300 Augers of different Sizes
150 Handsaws, adzes, and other Carpenters Tools
30 Dozen of Files of different sort
40 Dozen Gimlets
20 Dozen Nail Hammers
800,000 10d. Nails
300,000 6d. [Nails]
Ten Casks of 20d. Nails
Spikes and other Nails as the Service may determine
A, a large Quantity of Bar Iron Steel
A, 60,000 feet of 3 Inch oak Plank for platforms

The following Works are most suitable to be done during the Wir should there be Men sent to do it:

Making one hundred Platforms for Cannon.

1,000 Hand Barrows. Repairing of the old wood Axes.

Pickaxes, Shovels, Spades, etc. Making Carriages for Cannon.

To secure the old Fort with Plank by way of Blinds to prevent Surprise.

Building of 3 Block Houses on the Southeast Part of Mount Independence.

Building of a Block House East of the old Fort near the General's Quarters, or back of the Store by the Wharf. Building of a Block House on the Height of the old French Lines.

Driving Piles thro' the Ice across the Lake to strengthen the Boom.

Memorandum of Works to be done near Tyconderoga next Spring:

Building a Fort on Mount Independence with 14 Bastions and a covert way on the East and South Sides.

Finish the Barbet Battery with Merlons and close the Rear.

To repair the old Fort with Stone and Lime, and build a Block House on the South West Hill across the Lake.

—Papers of the Continental Congress, roll 30.

In London during the winter of 1776–77, Maj. Gen. John "Gentleman Johnny" Burgoyne revived the idea of a British thrust from Canada along the Lake Champlain–Hudson River route, and King George III heartily endorsed the proposal. According to the final plan, approved in late February 1777, Burgoyne would command a major offensive aimed at Ticonderoga and Albany, while a diversionary force moved along the Mohawk River toward Albany from the west. Once in Albany the two forces, with a combined strength of more than nine thousand men, were to make contact with General William Howe in New York City.

Burgoyne returned to Canada in early June. Three weeks later he sailed south on the Richelieu River to Lake Champlain. The campaign was under way. Meanwhile the rebels worked feverishly to ready Ticonderoga for the expected British assault. Baldwin, still chief engineer, again provided the most detailed account of events at Ticonderoga.

During the spring of 1777 one of Baldwin's major projects was a new bridge spanning Lake Champlain from Ticonderoga to Mount Independence, anchored in stone-filled piers and protected by a boom. The footbridge and boom completed the previous October had not survived the winter. The work was tough: the bridge required strong supports because of the lake's depth and swift current. Not surprisingly Baldwin suffered numerous reverses during the course of the operation. He was still working on the crossing in July when the British took Ticonderoga. Other projects that spring included a crane for hoisting supplies up the steep cliff on the western side of Mount Independence, a hospital and an ammunition factory on Mount Independence, and new redoubts near the old French lines on the Ticonderoga side of the lake.

On May 12 Lt. Col. Thaddeus Kosciuszko, a Polish volunteer and engineer officer, joined Baldwin at Ticonderoga. He was fresh from work on the Delaware River defenses and had been recommended by General Gates, now Ticonderoga commander. Although he expected Kosciuszko "to serve not supercede" Baldwin, Gates so valued Kosciuszko as an engineer that he wanted the Pole to examine the Ticonderoga works and make recommendations for necessary improvements and additions.

Inevitably some conflict resulted as Kosciuszko found the fortifications at Ticonderoga–Mount Independence lacking. He recommended a new entrenchment and suggested additional measures to keep ships clear of the fort. Taking further issue with Baldwin's work, Kosciuszko reported to Gates: "We are very fond here of making Block houses and they are all erected in the most improper places."[9] Wishing Kosciuszko's plans to be

A BLOCKHOUSE. *This plan is of a typical eighteenth-century blockhouse, probably similar to those erected on Mount Independence.*

Dunnack, *Maine Forts*

The Section and Plan of a Block-house

REFERENCE.

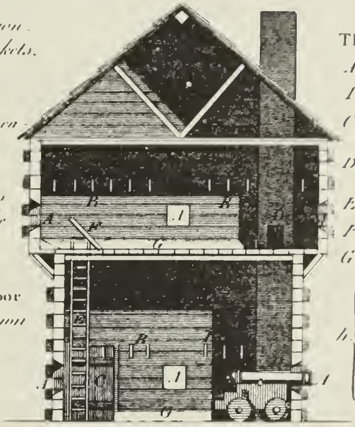
Fig. 1.

A. The Port holes for Cannon.
B. The loop holes for Muskets.
C. The Door.
D. The fire places.
E. The Ladder of Communication to the upper Story.
F. The Trap Door.
G. The platform that serves as a parapet, and for the Men to sleep on.

Fig. 2.

The Plan of the Ground Floor
A. The Port holes for Cannon
B. The fire place
C. The Door.
D. The platforms

Fig 1



REFERENCE.

Fig. 3.

The Plan of the upper Story
A. The port holes for Cannon.
B. The fire place.
C. The trap Door
D. The platform as in the lower Apartment
E. The Officers Apartment
F. The Door leading to it
G. The Window
h. Holes made in the floor to fire upon the Enemy if they gain poſseſsion of the lower Apartments.

Fig. 3

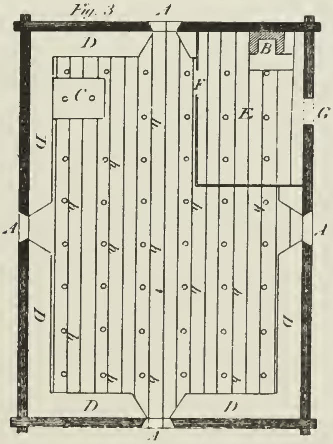
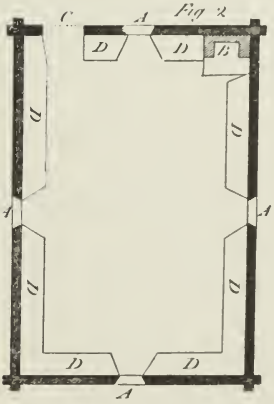


Fig 2



Scale of Feet

adopted, Gates declared, "Colonel Baldwin will gain my affection, and Esteem, by cultivating the Friendship of that Capable Young Man [Kosciuszko]."[10] After Kosciuszko returned to Ticonderoga in early June following a brief absence, the two engineers collaborated in directing additional works on both sides of the lake. Events at Ticonderoga in the period March–May, 1777, unfold in selections from Baldwin's journal.

7. BALDWIN CHRONICLES THE PROGRESS AT TICONDEROGA

From Jeduthan Baldwin's journal.

March 1 [*1777*]. Began to build the Great Bridge, from Ticonderaga to Independant point. . . .

9. Sunk 10 Cassoons and put down many of the posts. . . .

10. Geting down the Cassoons, the Ice began to fail.

11. Workt at ye Bridge, rode up East Creek.

12. Drawd. Plans for Hospital.

13. Began to cut timber for Hospitals, the Sleymen went off work.

14. The Ice very Roten, left working at the bridge, went over ye Mount. . . .

16. . . . Began the Plan of the Fort on Mount Independance.

17. Drawing plan. Raised the Roof of the Block house by Head Quarters. . . .

26. One Peer of the Grt Bridge fell to peices.

27. The Bottom of another Peer fell out. . . .

29. So Cold that we could not work at the Bridge. Geting Timber for ye Hospital. . . .

31. Finished giting timber for 4 Hospitals. A warm Day, wind at South. Ice fails fast.

April 1. At work at ye Bridge, Raisd ye Bake House.

2. Wrote to Genl. Schuyler and sent a plan of a proposed fort to be built on mount Independance, went with ye Qr. M. Genl. and laid out a large gardin at ye foot of the Mount. . . .

7. . . . Went over to Mount Independance. Lookt out a place to hoist the provisions out of the Lake on to the Mount with a Rope and blocks. Dind. with Genl. Wayne.

8. At the Bridge and among ye workmen. . . .

14. Rode to the landing with Mrs. Hay, Genl. Wayne, Col. Long, Majr. Hay and Esqr. Winslow, went to accompany her out of camp going to albany thinking it not safe to stay at this place as the Lake is now open for the Enemy and our Numbers inconsiderable by no means Equal to a body to defend this place. Drank Tea Punch and wine . . . and live as gayly as if danger was at a distance. . . .

19. 4 Indians fired at by the sentry at the Mills last night. At work at the Bridge, Block housen and Laying Platforms. . . .

20. Went to the mills and to mount Independance.

21. One of the piers of the Bridge turnd. over. . . .

24. Raisd. the fraim for the Crane on the edge of the Mount for hoisting up whatever may be wanted on Independance. . . .

[*May*] *9.* Laid out and began a Redout between the french lines and ye old fort on high Ground.

10. Carpenters left work at ye Bridge and went to driving a frieze round the front of the french lines. . . .

11. Began the Redout on ye Hill at ye french lines. 13 Tories brought in. . . .

14. Viewd. the Lines. At work on ye Redouts. A fine Day. . . .

15. Went round the lines with Lt. Col. Kosiosko. . . .

16. . . . Drawing plans of ye Hospital and the works at Fort George and Sent them down to Genl. Gates. Rainey Day.

17. Went round to the works on this side and on Mount Independance. . . . A Showry Day. . . .

19. Raisd. the flagstaff on Mount Independance.

20. Genl. Poor Came in with 600 Men.

21. Went round the work with Genl. Poor.

22. A large fatigue party at the French lines. . . .

23. At the works on the french lines and at Mt Independance. . . .

24. Majr. Ayres and Capt. Wilcott [Jarius Wilcox] Joind. my works as Assistant Engineers. . . . A fine pleasant day.

25. The boom and Bridge in a heavey gale of wind gave way and with some difficulty they were brought back to place. . . .

28. . . . Began another redout on the high ground N. W. from the fort in ye rear of ye french lines.

29. Work at ye Bridge Anchoring of ye Boom and geting Logs for it. Laid out a Redout to ye Left between ye old fort and french Lines . . . .

30. Recd. 9,000 Dollars, paid of my workmen. Had 10 Cannon come from Lake George. . . .

31. Rode to the Mills and round to the workmen. In the afternoon to Mt. Independ.

—Baldwin, *Revolutionary Journal*, pp. 94–104.

Next, an excerpt from the journal of Du Roi the Elder, a lieutenant and adjutant serving the Duke of Brunswick in Burgoyne's expeditionary force, offers the best description of Baldwin's "great bridge." Du Roi the Elder made his observations after the fall of Ticonderoga. He was considerably impressed by the rebel accomplishments achieved at such great expense.

MOUNT INDEPENDENCE. *The position is shown here as it is seen looking east from restored works on Mount Defiance.*
Photograph by Erik Borg, 1968

8. "THE REBELS HAD KEPT ON WORKING CONTINUOUSLY WITH UNFAILING COURAGE"

From the journal of Du Roi the Elder.

[*July 13th 1777.*] A bridge of more than 350 feet long, was built from Ticonderoga to Mount Independence, which served not alone for the purpose of communication between the two forts, but also to block completely the passage and entrance for ships to South Bay, a piece of work which should be noted for curiosity's sake, and which does honor to human mind and power. It is only to be regretted that the work was commenced for fighting purposes. It therefore, will hardly be completed as it deserves. It may be compared to the work of Colossus in the fables of the heathen. . . .

The width of the water between Ticonderoga and Mount Independence is, as mentioned before, more than 700 feet, and the depth in the middle 25 feet, which diminishes very little towards the banks, thus allowing even big vessels heavily loaded, to pass. The current is so strong that a pontoon bridge, or any other kind of floating bridge, could not resist it for any length of time, not taking into consideration an occasional strong wind. For supporting and strengthening the bridge 23 caissons (as the rebels called them), filled with stone, had been put into the water in a straight line across. These caissons are made of tree trunks 3–4 feet in diameter and 20–25 feet long, put together in squares. In the beginning they were kept in place by anchors. After they had been built up above the water, they were filled with quarry stones, of which there is an abundance. This would sink them and keep them in place under water.

If you take into consideration the depth of the water, you can get an idea of the amount of work involved.

It was first decided to put the bridge on top of these caissons, which, however, had not been completely filled with stone. The middle of the bridge was intended for a drawbridge for the passage of big vessels. Smaller boats were to pass underneath, the caissons extending above the water 10 feet and more. Now this plan was changed, and a floating bridge of strong beams was made on one side of the caissons. In order to prevent all vessels from passing this bridge, even by force, some sort of a turnpike had been constructed of beams fastened together with heavy chains three inches in diameter, completely blocking all passage. Although the construction of the bridge had cost them about 3000 lives in two years, the men dying from fatigue and fever contracted by the unhealthy location of the place and the foul water, the rebels had kept on working continuously with unfailing courage.

It is well worth mentioning this fact, as such perseverance is seldom found in the history, except in a republic, where a general participation in a common cause would inspire and hold it. It is rarely, if ever, found in monarchies.

—Epping, "Journal of Du Roi the Elder," pp. 151–53.

On 12 June 1777 Maj. Gen. Arthur St. Clair assumed command at Ticonderoga. The garrison was critically short of men and supplies. Yet because Ticonderoga was a symbol of rebel strength—some called it the "Gibraltar of the North"—it could not be abandoned without a violent protest. Thus political considerations outweighed strategic reality. Resolving at a meeting on the 20th to hold out as long as possible, St. Clair's council of war decided to upgrade the defenses. During the next two weeks there was a flurry of activity concentrated on Mount Independence. Although St. Clair believed Ticonderoga and Mount Independence to be so intimately connected that "it will be very dangerous to give up either," he reluctantly supported Schuyler's contention that Mount Independence could outlast Ticonderoga, perhaps indefinitely.[11]

By July 1, as the rebels placed themselves in a state of defense, Burgoyne positioned his army on the west side of the lake and dispatched the Germans under Baron Friedrich Adolphus von Riedesel to the east side. The attack began the following day. Mount Hope, guarding the route to Lake George, fell first: as the enemy approached, rebel forces burned and deserted the position.

Next Burgoyne wisely sent William Twiss, his chief engineer, to reconnoiter unfortified Sugar Loaf Hill. Although Kosciuszko had also urged fortification of the position, his arguments failed to convince Schuyler. Yet the move was even more crucial in 1777 than it had been a year earlier. None of the changes made at Ticonderoga—Mount Independence in the interim had made the 750-foot hill any less menacing. In fact, by allowing Sugar Loaf to go unfortified, the rebels dangerously exposed their bridge and the fortifications atop Mount Independence.

Concurring with the assessments of Trumbull and Kosciuszko, Twiss advised his commander to fortify Sugar Loaf Hill. Burgoyne agreed. Resolving that "where a goat can go a man can go, and where a man can go he can drag a gun,"[12] Brig. Gen. William Phillips took charge of the operation. By July 6 the British had positioned four twelve-pounders atop the hill, which they renamed Mount Defiance in recognition of their success. The enemy did not expect to shower the rebels with sustained gunfire. But the move dealt a decisive blow to American morale. St. Clair's council hurriedly decided to abandon Ticonderoga and Mount Independence, a wise decision militarily if not politically.

Although St. Clair's subordinates managed to bungle his plan of retreat, the rebel forces did escape across the bridge from Ticonderoga to Mount Independence the night of 5—6 July 1777. They partially destroyed the bridge behind them and withdrew into interior Vermont.

Recalling the circumstances of the American evacuation, Burgoyne stated:

> The manner of taking up the ground at Ticonderoga convinces me they have no men of military science . . . . They seem to have expended great treasure and the unwearied labor of more than a year to fortify, upon the supposition that we should only attack them upon the point where they were best prepared to resist.[13]

True, officers like Schuyler had overrated the potentialities of the position, particularly on Mount Independence. But the rebels would very likely have had to abandon Ticonderoga no matter which side had fortified Mount Defiance. The crucial problem for the Americans at Ticonderoga was that the works exceeded in scale the number of men allotted to defend them — three thousand regulars and militiamen at the time of the evacuation. Throughout the rebel occupation the imbalance had never been corrected.

Full details of the final attempt to shore up American defenses at Ticonderoga—Mount Independence and an evaluation of the rebels' chances for holding on to Mount Independence after the fall of Fort Ticonderoga came out more than a year later in testimony by Kosciuszko and Baldwin at St. Clair's court-martial. St. Clair was ultimately acquitted of charges of abandoning Ticonderoga and Mount Independence and of failing to place the forts in the highest state of readiness. Excerpts from the testimony of the two engineers make it clear that a major effort was undertaken at Ticonderoga after St. Clair's arrival, and that in abandoning both positions he exercised sound judgment.

9. THE COURT-MARTIAL OF MAJ. GEN. ARTHUR ST. CLAIR

September 17, 1778

Testimony of Kosciuszko

Colonel Koseiuszko being sworn, *General St. Clair's question.* Do you recollect what the strength of the fatigue parties was, that were employed on Mount Independence on or about the 23d day of June, 1777?

A. About five or six hundred men were employed on the batteries at Mount Independence as fatigue men, after General Schuyler had been at Ticonderoga, and had given directions to put new works on Mount Independence. There was also a party employed in front of the works, in a thick wood, cutting abbatis; I do not recollect the number. I remember that General Fermoy's brigade was employed in the wood cutting abbatis. General Fermoy himself was there two or three days. Besides these, I always sent a fatigue party to cut the abbatis.

General St. Clair's question. Do you know whether there was a fatigue party likewise employed at the time on the Ticonderoga side?

A. I know there was a fatigue party employed on the breast-work.

General St. Clair's question. Did you not, by my orders, make some additions to the works on the Ticonderoga side?

A. Yes; between the west end of the French lines and the Lake. It was not quite finished at the time of the evacuation.

General St. Clair's question. Supposing Ticonderoga to have been abandoned, and the enemy to have been in possession of it, would it have been possible to have maintained the works on the point of Mount Independence, that were made for the command of the Lake and the defence of the bridge?

A. No; as the ground overlooked them about fifty feet.

General St. Clair's question. Do you recollect where the place from which we got our water was, on Mount Independence side, and the situation of it?

A. On the west side of Mount Independence, on the low ground, near the Lake.

General St. Clair's question. Could we easily get at the water?

A. No; It was very steep, and I think about one half a mile distant from the fort.

General St. Clair's question. Supposing the enemy had passed some of their vessels into South Bay, would it not have been wholly in their power to have cut us off from the water?

A. The spring would have been exposed to the fire of the enemy.

General St. Clair's question. Do you recollect the distance from the Lake to East-Creek, beyond the south end of Mount Independence?

A. About one half a mile or three quarters.

General St. Clair's Question. Would it not have been in the enemy's power to have annoyed, from the vessels from South-Bay, any troops that might have been marching across the Isthmus to the relief of Mount Independence?

A. It would have been in the enemy's power to have done it on account of the passage being narrow, a thick wood, and the possession of the lake.

General St. Clair's question. Do you recollect whether any works were begun to improve the redoubt on the high ground, on the point of Mount Independence?

A. Yes; by your order I marked out the lines, and prepared the fascines; which was after General Schuyler left Ticonderoga.

General St. Clair's question. In what condition was the fort upon Mount Independence?

A. It was a picketted fort, only for small arms. Picketted all round, some good and some bad.

General St. Clair's question. How many men could the fort contain with convenience for the defence of it?

A. About 1000 men.

General St. Clair's question. What batteries had the enemy erected against Ticonderoga at the time, or before the evacuation took place?

A. One battery was erected against the Jersey redoubt on the opposite side of the Lake, about half a mile distant, and on higher ground. They had made some works where they had an encampment against the French lines, about half a mile or three quarters distant. The enemy had also taken possession of Mount Hope, a retrenched camp, which had been occupied by us the campaign before, by which the communication with Lake George was cut off. They had taken possession of the mill, burnt the block-house, and passed on the other side of the creek, where they took possession of a hill which commanded all Ticonderoga and Mount Independence, and had begun a firing on the sloop that was stationed for the defence of the passage from Lake George. They had also begun some works on a point on the east side of the Lake, opposite to the bridge. . . .

Q. Court. Could the enemy's vessels lie in South-Bay, in a situation to command the spring, and not be exposed to our batteries on Mount Independence?

A. There was high ground, and batteries could have been placed there to prevent them.

Q. Court. Could the enemy's ships lie in South-Bay, in a situation most to annoy a reinforcement going to Mount Independence, without being exposed to the fire of our batteries from Mount Independence?

A. They could.

Q. Court. Was there any other spring on Mount Independence, out of the enemy's fire, that the garrison could have been supplied with water from?

A. No other lasting one.

Q. Court. What kind of ground was it on the height on Mount Independence. Whether stony, difficult of raising a parapet on, or of sinking a ditch?

A. Very stony and rocky ground, and would require a great deal of labour to put on the works. A ditch could not be sunk to any proper depth without blowing the rocks. . . .

Testimony of Baldwin

General St. Clair's question. Do you recollect whether the working parties at Ticonderoga and Mount Independence were increased or decreased on or about the 23d day of June, 1777?

A. They were considerably increased. There were several works that were not finished that were ordered to be done, besides a number of new ones laid out that the men were ordered to work upon, and we continued at these works both at Mount Independence and Ticonderoga until the day we came away, besides a considerable reinforcement to the party at work upon the bridge. As the troops increased the working parties increased, we having almost every man upon the ground on duty of one kind or another. There was a regiment of militia constantly on duty in the woods, under my direction, providing timber for the bridge, that was not included in the details. I had about 100 men, besides the militia on duty with me there, that were not included in the details. I had about 30 out of the militia also making shingles, and a party making brick, not included in the details.

General St. Clair's question. Was the boom that was laid below the bridge in the Lake fixed in such a manner, that it would have been able to have resisted the shock of a vessel?

A. The anchors were chiefly lost from it, the cables having been broken by the ice. I rather think it would not have stopped their heavy vessels, though it might their smaller ones.

General St. Clair's question. Did you receive directions for building a general hospital at Ticonderoga, and were you not employed on that work?

A. I did, from General Schuyler. I was at work on it about the 23d of June, and the greater part of the fatigue-men were then taken from that work to be put on other works. Some of the artificers were taken off, though the greater part of them continued at work on it.

—"Trial of Major General St. Clair," pp. 58–61, 90–91.

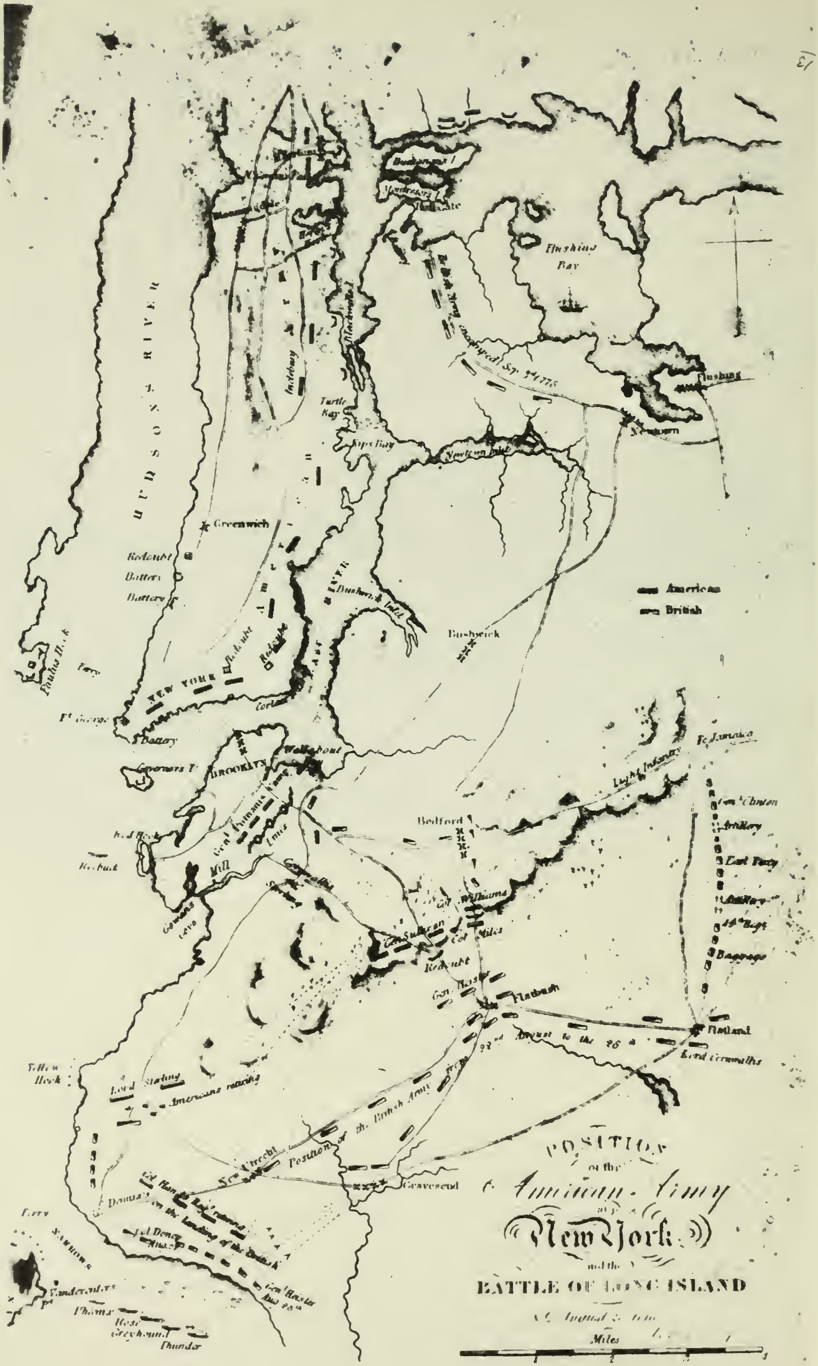
SARATOGA. *This view is from the restored American river works at Saratoga. Speaking of the position, fortified under Thaddeus Kosciuszko's direction, the American commander Horatio Gates declared: "In war, as in Medicine, natural causes not under our control, do much. In the present case, the great tacticians of the campaign, were hills and forests, which a young Polish Engineer was skilful enough to select for my encampment" (Quoted in Haiman,* Kosciuszko, *p. 29).*

Once Ticonderoga had fallen Burgoyne had a choice of two routes for his advance toward Albany. The preferable route led to the head of Lake George and from there across land for ten miles to the Hudson River at Fort Edward. A second route reached Fort Edward from Skenesboro and Fort Ann but involved many potential hazards. Making a crucial mistake, Burgoyne chose the less advantageous route for his troops.

Keeping barely ahead of the enemy, rebel work parties directed by engineer Kosciuszko impeded Burgoyne's advance by felling trees, digging ditches, and destroying bridges all along the way. The tactic worked: it took the British twenty days to move twenty-two miles. Shortages of food, horses, and supplies further afflicted Burgoyne, whose line of communications stretched precariously nearly 200 miles to Montreal. At Bennington on August 16 American irregulars halted a bold British foraging expedition into Vermont. Before the end of the month the enemy suffered another setback as their Indian allies abandoned Col. Barry St. Leger's thrust down the Mohawk River valley. Despite his failure to get supplies and reinforcements, Burgoyne persisted with characteristic arrogance in his slow march toward Albany. On September 13 he crossed the Hudson on a bridge of boats. A showdown was only days away.

Restored to the command of the Northern Department, Gates prepared to meet Burgoyne before he reached Albany. Kosciuszko, serving as Gate's engineer, chose and fortified a position on Bemis Heights overlooking the Hudson north of Stillwater near the village of Saratoga. On September 19, in the First Battle of Saratoga, the rebels attacked from trees and underbrush at Freeman's Farm as the enemy attempted to take the American left. Burgoyne was stopped, but he was not destroyed as he might have been, due to Gates's reluctance to move out of his entrenched position and his failure to support Arnold.

On October 7, after days of waiting in vain for reinforcements, Burgoyne launched another assault on the American left. In the ensuing Second Battle of Saratoga, Gates acted more decisively; and, defying orders, Arnold led an attack on the British entrenchments constructed at Freeman's Farm after the first battle. The results were devastating for the enemy. Burgoyne withdrew to Saratoga and on the 13th decided to negotiate a surrender. Four days later, after considerable haggling, Burgoyne accepted Gates's generous terms and signed the Convention of Saratoga.


POSITION
of the
American Army
at
New York
and the
BATTLE OF LONG ISLAND
August
Miles
1
2
3
HUDSON'S RIVER
EAST RIVER
Flushing Bay
Flushing
Newtown
Newtown Inlet
Kips Bay
Turtle Bay
Blackwells I.
Buchanans I.
Montresors I.
Hell Gate
Greenwich
Redoubt
Battery
Battery
Paulus Hook
Ferry
NEW YORK
Redoubt
Redoubt
Corlears
Ft George
Battery
Governors I.
BROOKLYN
Wallabout
Bushwick
Bushwick Inlet
American
British
Red Hook
Redoubt
Gowanus Cove
Mill
Gen. Putnam
Bedford
Light Infantry
To Jamaica
Genl Clinton
Artillery
Earl Percy
Artillery
49th Regt
Baggage
Col. Williams
Gen. Sullivan
Col. Miles
Redoubt
Gen. Heister
Flatbush
Flatland
Lord Cornwallis
23rd August to the 26
Position of the British Army
Yellow Hook
Lord Stirling
Americans retiring
New Utrecht
Gravesend
Denyse's
Col. Hand's Regt retiring on the landing of the British
Col. Donop
Gen. Heister Aug 26th
Narrows
Ferry
Vandeventers Pt
Phoenix
Rose
Greyhound
Thunder

Chapter V

A WAR OF POSTS: FROM LONG ISLAND TO TRENTON, 1776

Long before New York City became a center of military conflict in the Revolution, both sides recognized its strategic importance. To the Americans New York was vital to maintaining control of the whole Hudson River valley and thereby preventing the severing of New England from the middle states. The British, on the other hand, not only understood this point but also dreamed of gaining the active support of New York's Loyalist population. In 1775 events in Massachusetts required the antagonists to concentrate their efforts around Boston. As it was then thought that the Revolution would soon extinguish itself (the British view) or triumph (the American view) in Massachusetts, concern about New York was minimal.

By 1776, however, the situation had begun to change. In January the patriots still had the British boxed in at Boston, but American intelligence indicated the enemy's fleet was preparing to depart. Maj. Gen. Charles Lee, third in seniority after Generals George Washington and Artemas Ward, strongly urged action. Horrified at the prospect of the British occupying New York, he urged Washington to detach him there by way of Connecticut, where he would raise troops for the city's defense.[1] Washington complied, and on February 4 Lee arrived in New York City. For the next month he and Capt. William Smith, an engineer assistant borrowed from duty in New York City, made surveys and prepared a defense plan.

Lee had no formal engineer training. Yet because of his experience in both Europe and America as an officer in the British army, his knowledge of fortifications exceeded that of most American generals at the time. Notably, his plan cites the problem of defending New York without controlling the surrounding waters. The patriots could never hope to make New York an impregnable fortress, he argued. Rather their goal should be to fortify the city so extensively that taking it would cost the enemy dearly.

THE OPPOSING ARMIES AT NEW YORK CITY, 1776. *This map, reproduced from an unidentified book, shows the position of both armies in the area surrounding New York City on August 27.*
National Archives

Lee's fear of New York's considerable Loyalist population led him to advocate disarming the residents of Staten Island, and, for further safety, taking their children as hostages!

1. "NEW-YORK . . . MAY BE MADE A MOST ADVANTAGEOUS FIELD OF BATTLE"

Charles Lee's Plan for the Defense of New York and Long Island.

March, 1776

The command of the passage of the Sound [Hell Gate] must be ours. This, I imagine, is already effected by the works thrown up at Horn's Hook; but as a further security, batteries and a redoubt must be erected on the other side, either on Montresor's Island, or on the continent of Long-Island, as the Engineer and succeeding General shall determine. These additional works are not solely meant to shut up to the enemy the passage through the Sound, but to secure a free, open, and easy communication to our own troops, between the continent of New-York and Long-Island. As the city of New-York is almost environed by navigable waters, it is undoubtedly very difficult to fortify it against a powerful sea armament; but still I am of opinion that, although troops cannot easily be prevented landing under the guns of their shipping, they may be prevented lodging themselves in it, or converting it into a great place of arms, as they have done Boston.

The East-River, I am almost persuaded, may be secured in such a manner that their ships will scarcely venture into it, or at least they cannot keep their stations when in. A battery for this purpose is planned, and in some forwardness, at the foot of the Jews' Burying-Ground. To protect this battery from the near approach of ships, (which, when close, are always supposed to be an overmatch for batteries level with the water, and in a low situation,) guns in barbet, placed on the heights of the Jews' Burying-Ground, when in correspondence with a battery I have ordered on an opposite commanding knoll in Long-Island, will certainly be sufficient. These two fires will likewise be crossed by a third, of a very considerable range, from a work in the front of our intrenched camp on Long-Island; which work is likewise answered by a battery sunk in a cellar on the opposite wharf. Such is our plan with respect to the East-River.

Having attentively examined the fort [Fort George] and great batteries under it, and considered whether they could be of any possible use to us, I am of opinion that, as ships of great burden can approach so near the latter, it will be dangerous, if not impracticable, to support them. The fort cannot, for the same reason, be defended. But although it is not possible, in our hands, to render it a fortification of offence against the enemy, it

CARICATURE OF CHARLES LEE.
To his position as major general in the Continental Army Lee (1731–82) brought considerable military experience in both America and Europe, where he had achieved the rank of major general in the Polish Army in 1767. Lee came to America in 1773 and heartily endorsed the patriot cause. During the Revolutionary War he served in Boston, New York, New Jersey, and South Carolina. Always controversial, Lee was court-martialed in 1778 for insubordination during and after the Battle of Monmouth. Kosciuszko made this sketch of "a suspended Gen'l" after Monmouth.
Historical Society of Pennsylvania

might, in their possession, be converted into a citadel, to keep the town in subjection. These considerations have induced me to throw down the North-east and North-west Bastions, with the communicating curtain; so that, being entirely open behind, and a commanding traverse thrown across the Broadway, with three guns mounted, it is impossible for the enemy to lodge themselves in and repair the fort.

The North-River [Hudson] is so extremely wide and deep that it is in vain to think of any means to prevent the men-of-war commanding the navigation of it; but it does not appear to me that they have it in their power to annoy dangerously the town, much less to destroy it. It is true an accidental shell may do great mischief; but the effects of their cannon are not, I think, much to be apprehended, for there is a most fortunate ridge or eminence, which not only serves as a screen of protection for the town, but on which any number of batteries may be erected, to keep the ships at a distance.

I must observe, once for all, that New-York, from its circumstances, can with difficulty be made a regular tenable fortification; but it may be made a most advantageous field of battle—so advantageous, indeed, that if our people behave with common spirit, and the commanders are men of discretion, it must cost the enemy many thousands of men to get possession of it. The streets must be traversed and barricaded, so as to prevent their coming on our flanks; and three redoubts thrown up on the three eminences: Judge Jones's, Bayard's Hill, and either Lispenard's or Halderman's house, on Hudson's River. But these measures are not to be confined to the town. The whole Island is to be redoubted in certain regular steps, if I may so express it, quite to Kings's Bridge. These redoubts, redans, or fliches [fleches?] are easily thrown up, and are no expense.

The leading roads from Hudson's River, whence the enemy can alone approach, must be obstructed to artillery. King's Bridge must be strongly fortified, to preserve the communication free and open with Connecticut, on which Province you can alone depend for succors of men; for the breadth and depth of the North-River renders the communication with Jersey too precarious.

The possession and security of Long-Island is certainly of still greater importance than New-York. I have accordingly marked out a camp, fortified by a chain of redoubts, mutually supporting each other, and which, also corresponding with the batteries on the New-York side, will prevent the enemy's entering or remaining in the East-River. This camp is intended to contain four or five thousand men. Upon the whole, for the defence of Long-Island and New-York, eight thousand, at least, regular troops, will be necessary. . . .

I have now, in a military capacity, to the best of my recollection, mentioned every circumstance relative to the defence and security of New-York and Long-Island. But I think it my duty to observe that all these measures will be totally fruitless unless some precautions are taken with respect to the professed enemies of American liberty, nested in the very spots where they can do the greatest mischief—Queen's County and Staten-Island. . . . I would . . . humbly propose that the inhabitants of Staten-Island should, without loss of time, be disarmed, and their arms delivered to some regiment already raised, but unfurnished with muskets.

I do not imagine that the disarming the Tories will incapacitate them from acting against us, as they can easily be supplied by the ships. I should, therefore, think it prudent to secure their children as hostages. If a measure of this kind (hard as it may appear) is not adopted, the children's children of America may see the fatal omission.

—Force, *American Archives,* 4th ser., 5:214–15.

Washington felt Lee's plan "a very judicious one,"[2] but fast-moving developments in March assured the plan would have little chance of being fully carried out. Lee lacked men and barely saw construction started on his defenses when Congress gave him command of the newly created Southern

Department of the Continental Army. On March 7 Lee headed south, leaving New York City in the hands of Brig. Gen. William Alexander, Lord Stirling. With Lee's departure the defense of the city entered a new phase.

Capt. Jeduthan Baldwin provided the best account of progress made under Stirling's command. Baldwin's engineering tasks included drawing plans, tracing works, and overseeing their construction. That additions to Lee's plan were already under way was evidenced by Baldwin's work at Red Hook and Governor's Island, two new locations.

2. THE REBELS FORTIFY NEW YORK AND LONG ISLAND

From Jeduthan Baldwin's journal.

26. [*March 1776*]. Rode in Company with my Lord Sterling and Col. Smith with a No. of other Gentn to view the works round the Sitty and at the west End of Long Island. Dind with Genl. Thomson. . . .

27. Went round to the Several works in Town and out to the Fort at Hellgate or Horns hook where we dind.

28. Wrote Mr. John Adams. Laid out some work on Ship battery Hill. . . .

29. Rode round the works with the Genls. in ye forenoon, and in the afternoon gave an order to Capt Bruen for to provide materials for [the] Barrak at fort Ld. Sterling, bought a Cutlass for 16 1/2 Dol.

30. Began the work' on the old Fort to raise the parapet. It snowd this afternoon. Genl. Heath came to Town with Col. Groton' and Several other Regts.

31. Sunday. The men Excused from fateague and the ground was coverd. with snow and water.

April 1. Begun the old battery. Went round to ye Several works with Genl. Heath and others.

2. Went to long Island with Genl. Heath and my Ld. Sterling and others. Laid out and proposed several works there. In the Evning a party of our men, 200, went onto the Island by the Man of war and Set fire to the buildings, brought off Intrenching tools, fowls, etc. that belonged to Govr. Trion and returnd Safe. . . .

3. Drawd plan for 2 Works on Long Island, bought a Coat and Jaceat for 15 dollars. It raind in the forenoon. No fateague. The Sitizens Excused from fateague. Heard that the fleet was Sailed from Boston. Genl Putnam Came to this City.

4. Went Round to the Several works with Genl. Putnam and the other Genl. Officers. In the afternoon I went to horns hook, fort Thomson. A fine Day but windy.

5. To Long Island. Col. Smith went with Genl. Sterling to ye Gersies [Jerseys]. I laid out a Battery at ye heighth by ye feray on long Island. I went with Genl. Putnam and Genl. Thomson to Horns Hook.

6. Went to Red Hook.

7. Sunday. No fateague in the forenoon. Fireing over the Bay at ye Jersies, our riflemen took 9 and killd 3 of the Enemy, who came to take in Warter, with the loss of only one man wounded. Went with Genl. Putnam, Thomson, Col. Mifflin and Trumbull upon Governours Island and concluded to fortify that place. . . .

8. Went to Red Hook with Genl. Thomson, laid out a Battery on that point, and then I went to Governours Island, laid out the Fort. At dark one thousand men came on with the tools and went to work and before morning we had a fine trench. It raind all night and was Very uncomfortable. . . .

12. A wet snowey morning. Workt on the Fort and Battery with 400 men.

13. Wort at the Battery. Genl. Washington came to town, with Genl. Gates and others.

14. Workt. at the battery. Went to Long Island and to Govenours' Island where the troops workt. . . .

16. To Govenours Island. It raind. Recd. orders to get ready for to go to Quebec.

—Baldwin, *Revolutionary Journal,* pp. 31–34.

The decision to erect a chain of redoubts and breastworks from Wallabout Bay to Gowanus Marsh represented a modification of Lee's proposal for Long Island. At first Lee apparently intended to hold the Brooklyn Heights along the East River.[3] The new line would be further east.

Washington thought New York City in imminent danger of enemy takeover. He feared that the British, having been driven from Boston, would sail for New York rather than Halifax, Nova Scotia, as was widely expected. Washington warned Stirling: New York "is the Place that we must use every endeavour to keep." Once the British held New York, Washington contended, control of the Hudson River would follow. Then the enemy could sever communications between the northern and southern colonies, "upon which depends the Safety of America."[4]

As it turned out, the British did sail to Halifax; but Washington still saw New York as the next field of battle and moved there to join the bulk of his army. He ordered Col. Rufus Putnam, who had served the Continental Army in Boston as an engineer, to New York as his Chief Engineer. Over the next several months Washington relied heavily on the one-time millwright to lay out and oversee works in New York, New Jersey, and Long Island. "This was a Service of Much Feteague," Putnam later recalled, "for my whole time was taken up from daylight in the morning untill night in the business, besides Sometimes going in the night by Warter from New york to Fort Washington."[5]

On June 25, as anticipated, three warships with General William Howe and a small contingent of British troops aboard arrived from Halifax. Several days later, having observed American progress at fortifying Long Island, Howe chose Staten Island for his main encampment. Ultimately he assembled a force of some thirty-two thousand men, including eight thousand Hessians (German mercenaries) — "the greatest expeditionary force Great Britain had ever sent out from her shores."[6] That summer of 1776 the British virtually held the rebels—fewer in number, less well supplied, and without warships—in the palms of their hands. Yet several times Howe failed to move decisively. On July 12, for example, two British warships advanced forty miles up the Hudson. They returned the following week relatively unscathed, although under fire from American batteries all along Manhattan Island. Having flaunted American defenses, Howe still made no move against the forces stationed on Manhattan. Although the British commander genuinely feared allowing the Americans time to erect fortified positions, orders from London restrained him from acting.

The successful movement of British vessels up the Hudson sparked Robert Erskine, a Ringwood, New Jersey, ironmaster, to propose that chevaux-de-frise, generally used in Europe to block troop movements on land, be sunk under water to inhibit British vessels. Erskine, the future United States geographer, designed a model—described in his letter below—which he forwarded to Brig. Gen. John M. Scott of the New York militia. Erskine felt sure there was still time to employ the obstructions effectively in New York, or, at the very least, upriver.

3. ERSKINE DESCRIBES HIS MARINE CHEVAUX-DE-FRISE

Robert Erskine to John Scott.

Ringwood, July 18th, 1776

Dear Sir:—When I heard that some ships of war, with a fair wind and tide of flood, had passed the batteries with little or no damage [12 July]; I could not help regretting that the Channel was left open. I know it has been proposed to stop it up, but the present exigency requires some contrivance, that shall be both speedily executed and effectual. After canvassing this matter a little time, an invention which I beg leave to call a Marine Chevaux-de-Frise occurred. Of this I have sent you a model . . . .

Supposing, therefore, the Model to be before you, you will observe it consists of six pieces; it is made to a scale of half an inch to a foot. The pieces then represent beams a foot square and about 32 ft. long. If they were 13, 14 or 15 inches square, so much the better. The nails which join the pieces represent bolts (with a head on one side, to be keyed or screwed with a nut on the other), about 1 1/2 inches thick.

The Carpenter work is very little, each piece having only two notches, bevelled 60 degrees, or the angle of an equilateral triangle, and cut on one side about one-third of the thickness. . . . Any carpenter may line, square, notch and bore such pieces without knowing their use; in the same manner the blacksmith may be directed to make the bolts, and shoe them with sharp round iron, which is represented by the black upon the model. The beams could be shod all along like the spare piece, as then the iron would render it specifically heavier than water, but if the points are only shod, it will be necessary to plank in the . . . Tetrahedron, to contain pig iron or stones sufficient to sink it.

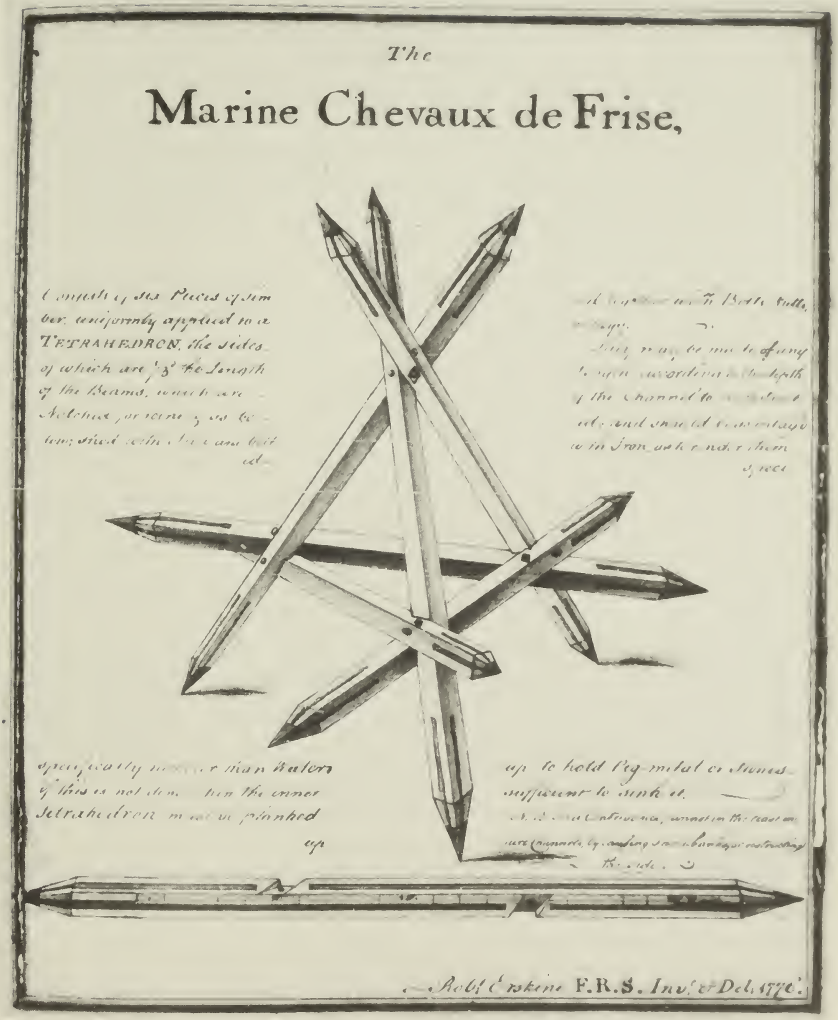
There is but one right way of putting the model together, which makes it necessary—though it appears simple—to observe it attentively and comprehend its construction before it is taken to pieces; when the construction is well understood, its putting together is very easy; if the pieces are all of the same dimensions and the notches alike—which they should be—they will fit any way. But to give a true practical idea of taking it to pieces and joining it again, please observe that the Tetrahedron has four horned corners, numbered 1, 2, 3, 4, and three horns to each corner. Place corner No. I uppermost. . . .

Any vessel being swept upon horns within 14 feet of the surface, would strike it, which must be attended with some of the following consequences: She would either be staked upon it, or her velocity over-set it, the other horns would then rise and take her in the bottom (which probably would make holes through her and oversett her too), or else she would break the "Chevaux-de-Frise" by her weight, which no ship could do without receiving such material damage as to render her unfit for service. . . .

But I need not further enlarge. I shall be happy if it could be put in practice soon enough to incomode our enemies at New York; if too late, then it may be practical elsewhere, particularly to prevent the approach of ships to the forts up the river.

It will naturally occur that this "Fence" should be placed in a channel commanded by a battery to prevent boats weighing them. Two "Chevaux-de-Frise" would reach about 60 feet or 10 fathoms [because the horns of one would be within twenty feet of the horns of the other], 20 would make over a channel of an hundred fathoms. Were they scattered here and there in a harbour or anchorage ground, it would render it very unsafe. I shall be happy if this invention could be put in practice soon enough to incommode our enemies at New York; 20 or 30 carpenters and a proper and able number of blacksmiths might finish as many as needful in 30 days. Those ships which have got up, however, may be fenced in at Kingsbridge, or elsewhere. They may be used to prevent ships approaching the forts in the Highlands . . . .

—Heusser, *Washington's Map Maker,* pp. 147—50.


The
Marine Chevaux de Frise,
TETRAHEDRON
to hold Pig-metal or Stones
sufficient to sink it.
Robt Erskine F.R.S. Inv.t & Del. 1776.

ROBERT ERSKINE'S CHEVAUX-DE-FRISE. *Although used for obstructions in the Hudson River between Forts Washington and Lee, Erskine's design was deemed impractical for Philadelphia because of the soft floor of the Delaware River.*

American Philosophical Society

Erskine's idea soon materialized with the placement of chevaux-de-frise opposite Fort Washington. But the rebels never finished the line from shore to shore, and the British continued to pass up and down the river with considerable freedom.

A month later Erskine offered his device to Benjamin Franklin for possible use in Philadelphia. Erskine saw great potential in the underwater obstacles, which, "dropt here and there in anchoring grounds and Harbours, would render them very unsafe." Since the current could flow uninhibited under each cheval, it would neither injure the channel nor interfere with the tide. Another advantage, Erskine argued, was that the chevaux could be assembled and stored until needed, as it only required a few hours to rig and sink them.[7]

Throughout July and most of August 1776 Washington's men waited for the British to move on either Manhattan or Long Island, or both. The delay allowed the rebels to enhance their position. Meanwhile, additional defensive operations went forward on the Raritan River at Perth Amboy, New Jersey, across the Hudson from Staten Island, where Brig. Gen. Hugh Mercer's "flying camp"[8] based its operations during July–November 1776. On July 16 Congress ordered Gilles Jean Marie Roland de Barazer, the Chevalier de Kermorvan, an engineer lieutenant colonel, to join Mercer's flying camp. Few records of Kermorvan's engineer service to the Army survive; but two letters written while he was with Mercer, shed significant light on defensive operations in New Jersey and reveal something of Kermorvan's character and the problems he encountered.

In the first letter, Kermorvan evinced a fairly sophisticated appreciation of coastal (in this case, river) defenses. He stressed the importance of placing an entrenched camp back from the coast to complement the fortifications at a river's entrance and to serve as a readily accessible retreat. "I am persuaded," he wrote, "that they [the generals] will agree that what I will tell them is worth more than what I see them practicing." He pressed for quick action by Congress to speed up the operations.

The brief encounter with British vessels that Kermorvan described was typical of many engagements that occurred during the New York campaign. The Frenchman was impressed by the "good will" and "fine bearing" of the American troops.

4. "I ONLY WISH FOR SPEED IN OPERATIONS"

The Chevalier de Kermorvan to Benjamin Franklin.

[Perth Amboy] July 26, 1776

Sir

. . . I have seen a part of the terrain, and I have busied myself with its defense; I have found the best of intentions in General Mercer, everyday I go to him to request his orders, and what he wants me to do, that gives me the opportunity to pose to him some questions on the position of the troops, on the communication of the patrols between here and Voodbridge [Woodbridge] and from Voodbridge to Elizabeth town, this part seems to me very weak however since I have spoken of the necessity to guard and watch over carefully all the points of the coast, I think that General Roberdeau has gone to Voodbridge to profit by and work up what I have said. I had passed to Mr. Hancock a general plan for the defense of the coasts of America,[9] I based it on the idea which I had taken from the terrain of Amboy and on the forces which we have there. I doubt that you will be able to put as many in all the parts but it is very necessary to execute it to cover and protect the cities of the interior. We do not have a stronghold to stop the enemy if he has the least advantage but if we form some entrenched camps at a mile or a half mile from the coast I defy all the powers of Europe to penetrate the lands. Especially if we fortify the entry of the rivers on the two coasts. If you had made these manoeuvres there in Canada you would not have pulled back farther than your entrenched camps where you increase the entrenchments in case you may be attacked and where the troops find an asylum for their courage when enemy numbers weigh them down. If the Congress feels the necessity of executing this plan of operation, it must certainly order its generals to do so, and if they have confidence in me, I will suggest to the generals the dispositions and manoeuvres to make when the enemy lands, I am persuaded that they will agree that what I will tell them is worth more than what I see them practicing. On the occasion of the little alarms that we have had yesterday and the day before yesterday on account of the passage of some little boats which skirted along Staten Island. I was delighted by the good will of our troops and by their fine bearing. In truth it would be a crime for good fellows like them to be victims of bad manoeuvres or dispositions. The day before yesterday during a big storm the sentinels noticed a boat which skirted Staten Island under cover of the night. The lightning bolts which were the only light in the sky discovered it to the sentinels which shot at it, immediately the whole troop on its own took up arms and descended to the bank, the boat made its course and we retired into our quarters. Yesterday four or five other little boats apparently loaded with wheat appeared at four-o-clock in the afternoon, they kept as far away as they could from our shore, we fired from our poor battery, first with the two little pieces of cannon; the enemy to protect these boats cannonaded our battery with three or four huge pieces of eighteen pound ball. This little combat lasted about two hours, our cannoniers firing with their little pieces as well as our enemies, they had the best bearing. During the whole battle I remained on the battery with General Mercer who had brought our two largest guns with which we touched the sails of one of these boats at a great distance. The range was too long for our pieces.

I only wish for speed in operations, one loses time without doing anything. Since I have been here, with the good will that our soldiers have for working, I would have already done a great deal of work which would have protected the entry of the Brunswick River [Raritan], where the enemy can draw us in order to make his descent to Amboy: we [?] fearing for the Jersey interior, would bring ourselves quickly there while the enemy would take over Amboy, in indulgence I ask on bended knees that the Congress decide to order speed and all will go well in our war. From extreme slowness in counsels, but the greatest speed in military operations. From this campaign here depends the liberty of America.

I forgot to tell you, Sir, that three of our people were wounded yesterday, not on the battery but one in a house and the others on the shore where they were watching, a horse was killed by a cannonball at a few fathoms from General Mercer's house.

If they construct the batteries or the fort that I have proposed to build here on the river, it will be necessary to send iron cannons with rampart mountings. Those which I have seen in the courtyard of the townhall would be good. Act, I implore you sir, such that they may decide and that the Congress may decide on swiftness in the operations so that we can be ready to receive milord [Howe] if he comes on one of our coasts with a strengthening-piece [gun] such as they say he is bringing. I wish you sir, good health and I pray you to accord and continue for me your friendship which I strive to merit as the friend of men and of liberty.

—Butterfield, "An Episode of '76," pp. 38–40. Translated by Patricia H. Stablein.

Kermorvan's second letter reflects much greater impatience with Congress and contains a reminder that European governments were observing military operations in America. He believed Congress had failed to understand his plan—perhaps thinking it too ambitious—and therefore had done nothing to carry out the small part pertaining to Amboy. Kermorvan displayed a considerable knowledge of batteries and river obstructions. Most importantly he detailed problems of command commonly encountered by engineers while overseeing fortifications, problems that were intensified for a foreigner.

Kermorvan seemed genuinely committed to the American cause of independence, and in his sharp annoyance with both Congress and the forces working for him he charged that "they wish almost all to have liberty without acquiring it."

5. "THE CRUCIAL POINT IS TO BRING THE CAMPS ON THE COASTLINE CLOSER TOGETHER"

The Chevalier de Kermorvan to Benjamin Rush.

Perth Amboy, about August 12, 1776

Sir

. . . I have perfectly felt the reasons which compell that it [Kermorvan's defense plan] will not be executed until the enemy has landed. Your people do not wish to work and see the danger only when the enemy is on them. The work of an entrenchment camp is nothing. It is the affair of one day for the troop which is in this camp. It is only an elevation of earth more or less high, more or less thick according to the terrain; moreover I had never meant to entrench 1500 miles of coastline, this work would be as useless here as the great wall of China which did not preserve that empire from being conquered by the tartars. All the same when you wish to protect a country, a province, there are no other means than to put, in flat places void of woodlands and other defenses, an entrenched camp and to occupy the heights with good artillery and the woodlands with infantry. Amboy is a place completely void of woods which has a circumference of two miles. If it is true that in all America the countryside is covered with woods, you have much less to fear, but in the present circumstance if we do not manage to keep the enemy from landing in the center of the colonies, we will lose our reputation in Europe which has its eyes wide open on us; thus the crucial point is to bring the camps on the coastline closer together because they are too far apart; then, if unfortunately the enemy lands, your people, seeing him entrench himself on his arrival, will not make themselves be begged to work, and, when they have the good will, you will admit, Sir, that is possible.

As far as forts at the mouths of rivers is concerned, as you do not have big cannons of 24, 36, and 48,[10] it is virtually useless to construct anything but simple batteries to stop the landing of troops and the passage of boats and the best defense of rivers whose mouths are wide will be to have galleys armed with big cannon or armed boats; because cannonballs of six and eight like we have here, have no effect on a ship and do not stop it one instant from passing. It is equally necessary to sink in the middle of passages some enchained piers, on the same level as the water but that will have to be done this winter because it is too late now.

I never would have imagined that if it is true that you cast cannon as everyone says, you do not cast the two thirds of large caliber, one does not make war profitably without the large cannon. Thus on a river where one wants to stop floating citadels, like ships, from passing, it is necessary to have only in the narrow places, as at Billingsport,[11] some batteries of large bore cannon, then there is not a ship of the line which dares to pass under a fire so close . . . we know in Europe that ships do not dare pass under the fire of St. Malo and of Brest. But these advantages are too dear for a budding republic, just simple batteries to stop boats coming down; some galleys or armed boats, sunken masses in the river passages—that's all you need as you have very judiciously reflected.

It is not as easy in a republic to execute great things right away because the consent of everyone is not easy to gather and all men do not think equally well in favor of the good cause; I see that they wish almost all to have liberty without acquiring it. I was more happy with their conduct at Philadelphia than here, you bourgeois give an example of ill will very harmful to our cause. In truth I believe that men are born to be slaves, for the most part, still they do not merit that one bothers oneself to look after their interest and to command them. I have made a battery which is very well placed, the cannons will fire and do a good job defending the river, the fire is well directed, but your people have so badly executed it against my will that I am embarrassed to have undertaken it. From the first day they have rebelled and have had it said to me that my way of making them place the sod and fagots was not to their taste and that they do not wish to do other than what they have always done, that they do not, moreover, want to work uselessly, that the enemy will not come into the river and that finally they are not paid to work. All these words and their discontent overwhelmed me. I had them told to do as they wished; I have in spite of that been to see them work twice a day and direct them in the plan of the work, they have placed the sod which has a slovenly appearance and which cannot sustain itself in a time as dry as summer. Judge, Sir, from my position, to do a badly executed work, to have a continual fever, to go four miles by foot every day in a state of weakness, to lie on straw, to have very little consideration in a country where genius is useless and his profession is that of a mason or regarded as such, to be able to do nothing for the good of the army and to spare the blood of the americans because I fear to displease. I have taken the part of telling the things which press most to be executed through M. du Bois who speaks willingly. Acknowledge, Sir, that one must be born for the general cause of humanity and not have any desire but to see this cause triumph for once, to patiently suffer these annoyances, but also I will die content, if your independence, established under good laws, is secured and makes an example for the rest of the world.

I have learned that M. de Woedke[12] died in Canada . . . . If you wish, Sir, to make me inherit from his rank, the right that I would have to participate in the counsels of war would give me more influence and more right to counsel the better deployments, without having more command responsibility which I do not desire at all, but just more ease which is necessary to me. I am beginning to speak, be it ever so little, english to make myself understood, I read it perfectly . . . I am not as familiar with the spirit of the american people that I know here, this people is the same everywhere inconstant and flighty, furthermore one needs men of spirit in whom the people will have some confidence who will speak to them from time to time about their duty to their country and of the common cause. Their generals whom they have elected should go see them in their tents to inspire them; the wounded should be visited and almost cared for by the first officers of the army, that is how the patriotic ardor sustains itself which it is necessary to infuse into the low and common souls.

In a country where there is so much ease it will always be difficult for you to have paid armies which you can command, it would be better for you, for a free state, to have an agricultural militia.

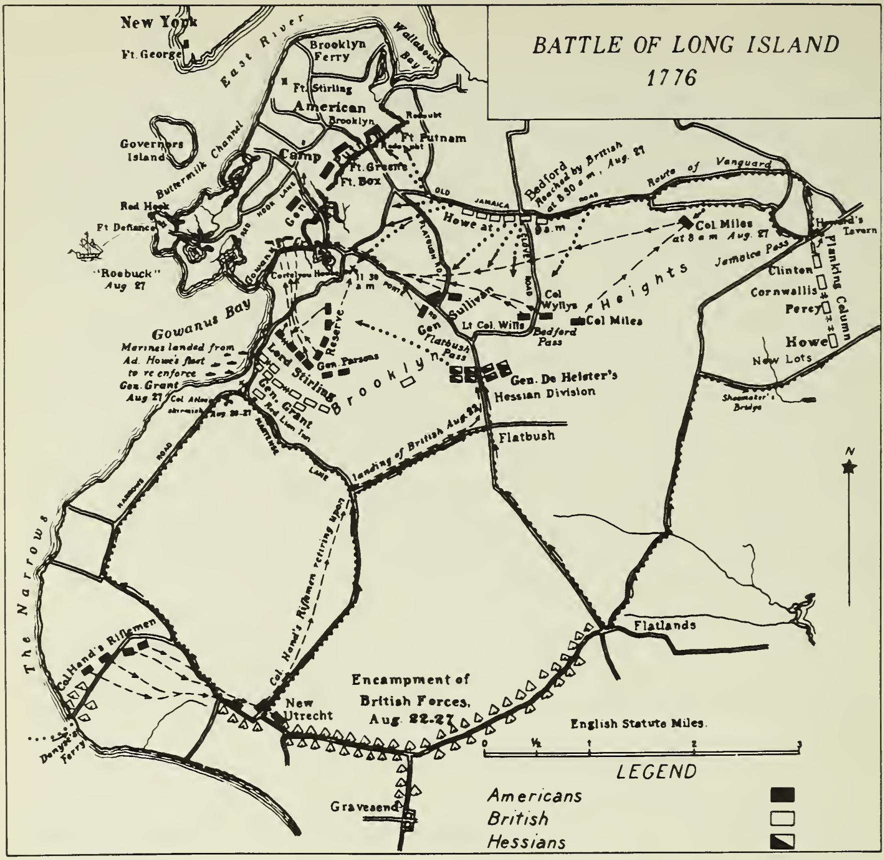
You know better than I do, Sir, that it is dangerous to have troops within your own bosom which are hired, for that is the origin of the corruption of states and morals of a people, for a free state should only have an agricultural militia, that everyone may work on the land and do their duty, and that there are no exemptions except for those who have children which replace them in their old age. . . .

—Butterfield, "An Episode of '76," pp. 40–43. Translated by Patricia H. Stablein.

On August 22 Howe finally acted decisively. A large contingent of British troops ferried from Staten Island to Long Island, landing virtually unopposed. The main enemy objective, it now appeared, was Brooklyn; but Washington still feared for Manhattan and accordingly divided his forces between New York and Long Island.

The American position on Long Island that August consisted of a line of five works—Forts Box, Greene, and Putnam, and two unnamed redoubts—connected by breastworks and stretching from Gowanus Bay to Wallabout Bay. Star-shaped Fort Greene, mounting six guns and commanding the American center, was the largest work on the island. Fort Putnam, a star fort, stood on a hilltop and formed the salient point of the American line. Behind the line stood Fort Stirling and Fort Defiance (Red Hook). Fort Stirling commanded the East River channel, and Fort Defiance, originally a battery but improved that summer, overlooked the eastern passage around Governor's Island. Though specific details are lacking, Rufus Putnam is known from orders issued by Washington to have played a large role in the erection of the Brooklyn works.

Southeast of the American defenses lay a row of heavily forested hills overlooking a broad, open plain. The elevation provided an excellent natural defense that complemented the fortifications behind them. In fact



BATTLE OF LONG ISLAND, 1776. *One of a series of maps prepared by the Army War College, this map depicts the positions and movements of the American and British armies.*
National Archives

the rebels stationed the bulk of their Long Island forces along the ridge of hills, hoping to cut off a British advance before it reached the American works.

On Long Island Howe's strategy was to divert the American right wing (Gowanus Bay) while personally leading a large force through the Jamaica Pass (where one of four roads crossed the elevation in front of the American line) to attack the weak American left between Forts Greene and Putnam. On the night of August 26 Howe made his move. The next day American resistance on the left collapsed. By midday the British forced the rebels to retreat from their forward positions to a point behind their entrenchments. Their backs against the East River, the rebels awaited the inevitable storming of the lines, another Bunker Hill.

Strong winds and Howe's reluctance to act at Brooklyn as he had at Bunker Hill very probably kept this first open engagement on the battlefield from being the last. The ships commanded by his brother, Admiral Richard Howe, were unable to get behind the American lines where they might have delivered devastating fire. And General Howe, for his part, held back his men from a frontal assault. The risks of such an assault were too great, Howe thought, when it was "apparent that the lines must have been ours at a very cheap rate by regular approaches."[13]

Howe's memory of the murderous rebel musketfire at Bunker Hill undoubtedly influenced his decision. In later defending the general's action, Capt. John Montresor, the chief British engineer in America, said: "They [the American redoubts] could not be taken by assault, but by approaches, as they were fortresses rather than redoubts."[14] Within two days the British constructed their own redoubt several hundred yards from the American left and began regular siege operations.

Washington called a council of war on the 29th to consider withdrawing to New York City. Citing as its reasons the division of the army between New York and Long Island and British control of the waterways, the council unanimously favored retreat. Washington's generals also were apprehensive that their lines would not withstand a frontal attack. Contrary to Montresor's assessment, the council argued: "Tho' our Lines were fortified with some strong Redoubts, yet a Great part of them were weak being only abbattied with Brush, and affording no strong cover."[15]

While he seemed to be planning to reinforce his troops, Washington actually was preparing to retreat. The only way out of Brooklyn was across the East River to Manhattan. The operation would be difficult: more than ten thousand men and considerable stores had to be moved fast to avoid British detection, and it required skilled boatmen to master New York's tricky tides and winds.

Washington was fortunate to have immediately available two units whose experience suited them well for an amphibious operation. On the night of August 29–30 he called on Col. John Glover's 14th Continental Regiment (Marblehead, Massachusetts) and Col. Israel Hutchinson's 27th Continental Regiment (Salem) to man the boats. These units, composed largely of sailors and fishermen,[16] met the challenge well.

Under Washington's careful direction the men of Marblehead and Salem—many of them wearing the blue jackets, white caps and tarred trousers of their trade—ferried the entire American camp in flatboats and sloops across the East River to relative safety on Manhattan. The weather cooperated beautifully. The heavy rain and wind that drenched the American camp, ruined ammunition, and complicated the crossing also kept British ships from moving up the East River to cut off the retreat. The entire operation was completed by seven o'clock the morning of the 30th. Washington had lost the battle but had skillfully kept his army intact.

New York City offered only temporary refuge for Washington's army. Entrapment was again a real possibility, as the only feasible escape route led across a bridge at the northern end of Manhattan Island. Washington asked his generals whether he should attempt to hold New York City. The issue was an emotional one involving more than military considerations. Maj. Gen. Nathaniel Greene, who knew the New York–Long Island terrain best, urged evacuating and burning the city.

Chief Engineer Rufus Putnam surveyed Manhattan for Washington and advised bringing the army together rather than dispersing it throughout the island. In his report to Washington Putnam properly recognized the importance of British naval and numerical superiority. He favored entrenching on Harlem Heights and Mount Washington, thereby abandoning any attempt to hold the city, which then was limited to the southernmost tip of Manhattan Island. Significantly, Putnam saw the defense of the Hudson River and the Highlands above New York and the maintenance of communications as the only reasons for keeping forces on the island.

6. PUTNAM RECONNOITERS THE ISLAND OF MANHATTAN

Rufus Putnam to George Washington.

Bloomingdale, September 3, 1776

Sir: According to your Excellency's order, I have reconnoitered every part about the Island of New-York and the main, as far as Frog's Point, and, on a full view, find the enemy have such a variety of places to choose out of, that it's impossible to prevent their landing when they please. They have such guides and intelligence of our movements that they can always avoid or surprise any parties that are posted to oppose their landing. Their army is so numerous that they can attack any division of our army with a superiour force; and yet, while our army is extended from New-York to King's Bridge, 'tis necessary to have a body of reserve at this place. But I cannot think it would be best, nor have we time, to make fortifications; since the moment any quarter is attacked, the whole body of reserve, I conclude, will be ordered to support it. I should advise the throwing obstructions in the way of landing. That they have one week's provisions always with them, and teams ready to carry their baggage wherever the service requires.

I mentioned to your Excellency that I thought your army should be collected together in some advantageous place, where supplies might be had, and a camp fortified in such a manner as the enemy dare not attack, or, if they did, must be repulsed; and I think so still, if it be possible to effect it. And to defend the passage of the North River, which I take to be the capital object, and at the same time keep open a communication with the

Eastern and Southern Colonies, is to press the army from Bundet landing, on the Jersey shore—Mount Washington and the Heights, south as far as Colonel Thompson's house, on Harlem River—the Heights we now possess at King's Bridge, and as far south as the Three Trees. The batteries on the Jersey side to be filled with guns; the battery on the rocks below Mount Washington completed; a new one built below the hill opposite the sunken vessels. These, well filled with guns and ammunition, if the galleys also afforded their assistance, would render it very difficult for ships to pass. If they attempted to force this post, I think they must be beaten. If they detached into the country on either hand, it must scatter their army in such a manner that your Excellency must drub them. But if supplies cannot be had at this place, at the Highlands they may, both by land and water. I think there has been some proof the ships dare not attempt that passage; but they are not prepared to defend against a landing. This is surely worth attention; for if they possess themselves of this passage, we shall be in a bad box. For my sentiments about that place, I refer your Excellency to Lord Stirling's report last May. I know that this doctrine gives up York to destruction, and exposes many other towns to be ravaged by them. But what are ten or twenty towns to the grand object? If they once pass the Highlands, I see no way to prevent the junction of their armies. Burgoyne need never come from Canada. If Howe gets to Albany, our Northern Army must quit Ticonderoga, or fall a sacrifice.

—Force, *American Archives*, 5th ser., 2:140.

As he pondered evacuating New York City, Washington wrote an extremely revealing letter to Congress. Of particular interest are his comments on fortifications and the defensive nature of the war. At this point he reluctantly conceded the loss of the city but firmly believed that Forts Washington and Lee and the river obstructions would check any advance north by the enemy. Washington's letter helps clarify American strategy in New York and elsewhere.

7. "I HAVE NEVER SPARED THE SPADE AND PICK AX"

George Washington to the President of Congress.

Headquarters, New York, September 8, 1776

. . . Before the landing of the Enemy on Long Island, the point of Attack could not be known or any satisfactory Judgment formed of their Intentions. It might be on Long Island, on Bergen or directly on the City, this made it necessary to be prepared for each, and has occasioned an Expence of Labour which now seems useless and is regretted by those who form a Judgment from after Knowledge. But I trust, men of discernment will think differently and see that by such Works and preparations we have not only delayed the Operations of the Campaign, till it is too late to effect any capital Incursion into the Country, but have drawn the Enemy's forces to one point and obliged them to decline their plan, so as to enable us to form our defence on some Certainty. It is now extremely obvious . . . they mean to enclose us on the Island of New York by taking post in our Rear, while the Shipping effectually secure the Front, and thus either by cutting off our communication with the Country, oblige us to fight them on their own Terms, or surrender at discretion, or by a brilliant Stroke endeavour to cut this Army in pieces and secure the Collection of Arms and Stores which they well know we shall not be soon able to replace . . . In deliberating on this Question it was impossible to forget, that History, our own experience, the advice of our ablest Friends in Europe, the fears of the Enemy, and even the Declarations of Congress demonstrate, that on our Side the War should be defensive. It has even been called a War of Posts. That we should on all Occasions avoid a general Action, or put anything to the Risque, unless compelled by a necessity, into which we ought never to be drawn.

The Arguments on which such a System was founded were deemed unanswerable and experience has given her sanction. With these views, and being fully persuaded that it would be presumption to draw out our Young Troops into open ground, against their Superiors both in number and Discipline; I have never spared the Spade and Pick Ax; I confess I have not found that readiness to defend even strong Posts, at all Hazards, which is necessary to derive the greatest benefit from them. The honor of making a brave defence does not seem to be a sufficient stimulus, when the success is very doubtful, and the falling into the Enemy's hands probable. But I doubt not this will be gradually attained. We are now in a strong Post, but not an Impregnable one, nay acknowledged by every man of Judgment to be untenable, unless the Enemy will make the Attack upon Lines, when they can avoid it and their Movements indicate that they mean to do so. To draw the whole Army together in order to arrange the defence proportionate to the extent of Lines and works, would leave the Country open to an Approach and put the fate of this Army and its Stores on the hazard of making a successful defence in the City, or the Issue of an Engagement out of it. On the other hand to abandon a City, which has been by some deemed defensible and on whose Works much Labour has been bestowed, has a tendency to dispirit the Troops and enfeeble our Cause. It has also been considered as the Key to the Northern Country. But as to this I am fully of opinion, that by Establishing of strong posts at Mont Washington on the upper part of this Island and on the Jersey side opposite to it, with the Assistance of the Obstructions already made and which may be improved in the Water, that not only the navigation of Hudson's River but an easier and better communication, may be effectually secured between the Northern and Southern States. This I believe every one acquainted with the situation of the Country will readily agree to, and will appear evident to those who have an Opportunity of recuring to good maps. These and the many other consequences, which will be involved in the determination of our next measure, have given our Minds full employ and led every one to form a Judgement, as the various objects presented themselves to his view. The post at Kings Bridge is naturally strong and is pretty well fortified the Heights about it are commanding and might soon be made more so. . . .

. . . I am sensible a retreating Army is incircled with difficulties, that the declaring and Engagement subjects a General to reproach and that the common Cause may be in some measure affected by the discouragements which it be made with any Probability of success, especially after our loss upon Long Island: but when the fate of America may be at stake on the Issue; when the Wisdom of cooler moments and experienced Men have decided that we should protract the War if Possible; I cannot think it safe or wise to adopt a different System, when the season for Action draws so near a close. That the Enemy mean to Winter in New York there can be no doubt; that with such an Armament they can drive us out is equally clear. The Congress having resolved, that it should not be destroyed, nothing seems to remain but to determine the time of their taking Possession.

—Fitzpatrick, *Writings of Washington*, 6:27–29, 31–32.

On 12 September 1776 the council of war agreed that New York could not be held. Washington removed the bulk of his troops to the Harlem Heights,[17] a plateau lying at the upper end of Manhattan between the Harlem River and the Hudson, where he projected a series of three lines of entrenchments. Putnam exercised great responsibility in securing the new American position. Washington ordered his commanding officers "to turn out every man they have off duty, for fatigue, and to apply to Col. Putnam for tools, and directions where and how to work."[18]

On the 15th, after landing successfully at Kip's Bay, the British seized the entire southern half of Manhattan and barely missed cutting off the retreat of some of Washington's men. They began building their own fortifications. Once again Washington waited for Howe's next move, and once again the British general delayed.

That September a vessel known as the *American Turtle* submerged in New York harbor several times in an effort to attach explosives to British ships. The Americans were trying a new tactic—submarine warfare. David Bushnell, a student at Yale College in the 1770's, had designed and built the

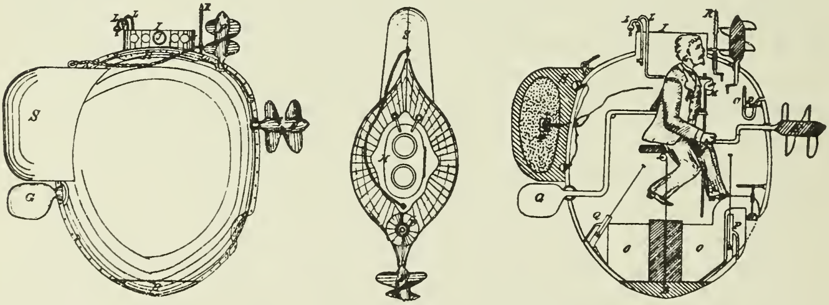
Turtle at Saybrook, Connecticut, with the assistance of his brother, Ezra. Bushnell operated on the premise that the force of an explosion under water would *not* dissipate itself harmlessly, a premise he tested in several experiments while at Yale. "They all produced very violent explosions," Bushnell later recalled, "much more than sufficient for any purpose I had in view."[19] Having shown the viability of underwater explosions, he next developed his submarine, believing it to be the best way to convey explosives to a target ship. Finally he designed a powder magazine and a means of attaching it to the target.

In the spring of 1775 the brothers finished their vessel and quickly won support for their idea from Silas Deane, Yale alumnus and Connecticut congressman; Connecticut's Governor Jonathan Trumbull; Maj. Gen. Israel Putnam; and, ultimately, George Washington. Washington agreed to furnish Bushnell "with money and other aids to carry his plan into execution."[20]

An underwater vessel presented many design problems. In addition to a watertight and pressure-resistant hull, the sub needed a reliable steering mechanism, vertical stability, variable ballast, and vertical and horizontal mobility. In a letter to Thomas Jefferson, written in 1787 and read eleven years later at the American Philosophical Society, Bushnell described the *Turtle*, explained his solutions to the problems of underwater warfare, and related how he had first tested his vessel.

8. BUSHNELL'S GENERAL PRINCIPLES AND CONSTRUCTION OF A SUBMARINE VESSEL

The external shape of the sub-marine vessel bore some resemblance to two upper tortoise shells of equal size, joined together; the place of en-



SKETCHES OF BUSHNELL'S *AMERICAN TURTLE. In the left figure,* S *indicates the powder magazine, and* G *the rudder. The propeller-like projections on the side and top are oars for horizontal and vertical movement.* R, *next to the top oar, is the wood screw.*
Abbot, *Modern Submarine Warfare*

trance into the vessel being represented by the opening made by the swell of the shells, at the head of the animal. The inside was capable of containing the operator, and air, sufficient to support him thirty minutes without receiving fresh air. At the bottom opposite to the entrance was fixed a quantity of lead for ballast. At one edge which was directly before the operator, who sat upright, was an oar for rowing forward or backward. At the other edge, was a rudder for steering. An aperture, at the bottom, with its valve, was designed to admit water, for the purpose of descending; and two brass forcing-pumps served to eject the water within, when necessary for ascending. At the top, there was likewise an oar, for ascending or descending, or continuing at any particular depth—A water-gauge or barometer, determined the depth of descent, a compass directed the course, and a ventilator within, supplied the vessel with fresh air, when on the surface.

The entrance into the vessel was elliptical, and so small as barely to admit a person. This entrance was surrounded with a broad elliptical iron band, the lower edge of which was let into the wood of which the body of the vessel was made, in such a manner, as to give its utmost support to the body of the vessel against the pressure of the water. Above the upper edge of this iron band, there was a brass crown, or cover, resembling a hat with its crown and brim, which shut water tight upon the iron band: the crown was hung to the iron band with hinges so as to turn over sidewise, when opened. To make it perfectly secure when shut, it might be screwed down upon the band by the operator, or by a person without.

There were in the brass crown, three round doors, one directly in front, and one on each side, large enough to put the hand through—when open they admitted fresh air; their shutters were ground perfectly tight into their places with emery, hung with hinges and secured in their places when shut. There were likewise several small glass windows in the crown, for looking through, and for admitting light in the day time, with covers to secure them. There were two air pipes in the crown. A ventilator within drew fresh air through one of the air pipes, and discharged it into the lower part of the vessel; the fresh air introduced by the ventilator, expelled the impure light air through the other air pipe. Both air pipes were so constructed, that they shut themselves whenever the water rose near their tops, so that no water could enter through them, and opened themselves immediately after they rose above the water.

The vessel was chiefly ballasted with lead fixed to its bottom; when this was not sufficient, a quantity was placed within, more or less, according to the weight of the operator; its ballast made it so stiff, that there was no danger of oversetting. The vessel with all its appendages, and the operator, was of sufficient weight to settle it very low in the water. About two hundred pounds of the lead, at the bottom, for ballast, would be let down forty or fifty feet below the vessel; this enabled the operator to rise instantly to the surface of the water, in case of accident.

When the operator would descend, he placed his foot upon the top of a brass valve, depressing it, by which he opened a large aperture in the bottom of the vessel, through which the water entered at his pleasure; when he had admitted a sufficient quantity, he descended very gradually; if he admitted too much, he ejected as much as was necessary to obtain an equilibrium, by the two brass forcing pumps, which were placed at each hand. Whenever the vessel leaked, or he would ascend to the surface, he also made use of these forcing pumps. When the skilful operator had obtained an equilibrium, he could row upward, or downward, or continue at any particular depth, with an oar, placed near the top of the vessel, formed upon the principle of the screw, the axis of the oar entering the vessel; by turning the oar one way he raised the vessel, by turning it the other way he depressed it.

A glass tube eighteen inches long, and one inch in diameter, standing upright, its upper end closed, and its lower end, which was open, screwed into a brass pipe, through which the external water had a passage into the glass tube, served as a water-gauge or barometer. There was a piece of cork with phosphorus on it, put into the water-gauge. When the vessel descended the water rose in the water-gauge, condensing the air within, and bearing the cork, with its phosphorus, on its surface. By the light of the phosphorus, the ascent of the water in the gauge was rendered visible, and the depth of the vessel under water ascertained by a graduated line.

An oar, formed upon the principle of the screw, was fixed in the forepart of the vessel; its axis entered the vessel, and being turned one way, rowed the vessel forward, but being turned the other way rowed it backward; it was made to be turned by the hand or foot.

A rudder, hung to the hinder part of the vessel, commanded it with the greatest ease. The rudder was made very elastic, and might be used for rowing forward. Its tiller was within the vessel, at the operator's right hand, fixed, at a right angle, on an iron rod, which passed through the side of the vessel; the rod had a crank on its outside end, which commanded the rudder, by means of a rod extending from the end of the crank to a kind of tiller, fixed upon the left hand of the rudder. Raising and depressing the first mentioned tiller turned the rudder as the case required.

A compass marked with phosphorus directed the course, both above and under the water; and a line and lead founded the depth when necessary.

The internal shape of the vessel, in every possible section of it, verged towards an ellipsis, as near as the design would allow . . . . The body of the vessel was made exceedingly strong; and to strengthen it as much as possible, a firm piece of wood was framed, parallel to the conjugate diameter, to prevent the sides from yielding to the great pressure of the incumbent water, in a deep immersion. This piece of wood was also a seat for the operator.

Every opening was well secured. The pumps had two sets of valves. The aperture at the bottom, for admitting water, was covered with a plate, perforated full of holes to receive the water, and prevent any thing from choaking the passage, or stopping the valve from shutting. The brass valve might likewise be forced into its place with a screw, if necessary. The air pipes had a kind of hollow sphere, fixed round the top of each, to secure the air-pipe valves from injury: these hollow spheres were perforated full of holes for the passage of the air through the pipes: within the air-pipes were shutters to secure them, should any accident happen to the pipes, or the valves on their tops.

Wherever the external apparatus passed through the body of the vessel, the joints were round, and formed by brass pipes, which were driven into the wood of the vessel, the holes through the pipes were very exactly made, and the iron rods, which passed through them, were turned in a lathe to fit them; the joints were also kept full of oil, to prevent rust and leaking. Particular attention was given to bring every part, necessary for performing the operations, both within and without the vessel, before the operator, and as conveniently as could be devised; so that every thing might be found in the dark, except the water-gauge and the compass, which were visible by the light of the phosphorus, and nothing required the operator to turn to the right hand, or to the left, to perform any thing necessary. . . .

Description of a magazine and its appendages, designed to be conveyed by the sub-marine vessel to the bottom of the ship. In the forepart of the brim of the crown of the submarine vessel, was a socket, and an iron tube, passing through the socket; the tube stood upright, and could slide up and down in the socket, six inches: at the top of the tube, was a wood-screw . . . fixed by means of a rod, which passed through the tube, and screwed the wood-screw fast upon the top of the tube: by pushing the wood-screw up against the bottom of a ship, and turning it at the same time, it would enter the planks; driving would also answer the same purpose; when the wood-screw was firmly fixed, it could be cast off by unscrewing the rod, which fastened it upon the top of the tube.

Behind the sub-marine vessel, was a place, above the rudder, for carrying a large powder magazine, this was made of two pieces of oak timber, large enough when hollowed out to contain one hundred and fifty pounds of powder, with the apparatus used in firing it, and was secured in its place by a screw, turned by the operator. A strong piece of rope extended from the magazine to the wood-screw . . . above mentioned, and was fastened to both. When the wood-screw was fixed, and to be cast off from its tube, the magazine was to be cast off likewise by unscrewing it, leaving it hanging to the wood-screw; it was lighter than the water, that it might rise up against the object, to which the wood-screw and itself were fastened.

Within the magazine was an apparatus, constructed to run any proposed length of time, under twelve hours; when it had run out its time, it unpinioned a strong lock resembling a gun lock, which gave fire to the powder. This apparatus was so pinioned, that it could not possibly move, till, by casting off the magazine from the vessel, it was set in motion.

The skilful operator could swim so low on the surface of the water, as to approach very near a ship, in the night, without fear of being discovered, and might, if he chose, approach the stem or stern above water, with very little danger. He could sink very quickly, keep at any depth he pleased, and row a great distance in any direction he desired, without coming to the surface, and when he rose to the surface, he could soon obtain a fresh supply of air, when, if necessary, he might descend again, and pursue his course. . . .

In the first essays with the sub-marine vessel, I took care to prove its strength to sustain the great pressure of the incumbent water, when sunk deep, before I trusted any person to descend much below the surface: and I never suffered any person to go under water, without having a strong piece of rigging made fast to it, until I found him well acquainted with the operations necessary for his safety. After that, I made him descend and continue at particular depths, without rising or sinking, row by the compass, approach a vessel, go under her, and fix the *wood-screw* . . . into her bottom, etc., until I thought him sufficiently expert to put my design into execution.

I found, agreeably to my expectations, that it required many trials to make a person of common ingenuity, a skilful operator . . . .

—*Transactions of the American Philosophical Society*, 4:303–09.

The Bushnells had planned to use the *Turtle* in Boston, but mechanical problems and the need to keep the operator in constant training delayed them more than a year. Then on the night of 6 September 1776 the *Turtle* made its debut in New York harbor. Sgt. Ezra Lee of the 10th Continental Regiment, an untrained substitute for Ezra Bushnell, piloted the sub alongside Admiral Howe's 64-gun *Eagle* but was unable to screw the powder magazine into the enemy vessel because of an iron plate passing from the *Eagle*'s rudder hinge and spiked under the ship's quarter. Lee vividly recounted his experience in a letter written nearly forty years later to David Humphreys, a biographer of Maj. Gen. Israel Putnam.

As described by Lee, his task must have been exhausting. He was constantly pedaling and cranking, pumping water from the ballast tank, worrying about detection, surfacing and submerging again, and all the while fighting New York's tricky currents and an ebb tide. In his letter to Jefferson, Bushnell correctly emphasized the need for a skillful operator, but he might also have shown greater appreciation for the sheer strength required.

9. "I THOUGHT THE BEST GENERALSHIP WAS TO RETREAT AS FAST AS I COULD"

Ezra Lee to David Humphreys.

Lyme [Conn.] 20th Feb'y, 1815

. . . The first night after we got down to New York with it that was favourable (for the time for a trial must be when it is slack water and calm, as it is unmanagable in a swell or a strong tide) the British fleet lay a little above Staten Island. We set off from the city: the whale boats towed me as nigh the ships as they dared to go and then case me off. I soon found that it was too early in the tide, as it carried me down by the ships. I however hove about and rowed for 5 glasses by the ships' bells before the tide slacked, so that I could get alongside of the man of war which lay above the transports. The moon was about 2 hours high, and the daylight about one. When I rowed under the stern of the ship I could see the men on deck and hear them talk. I then shut down all the doors, sunk down and came under the bottom of the ship. Up with the screw against the bottom but found that it would not enter. I pulled along to try another place, but deviated a little one side and immediately rose with great velocity and come above the surface 2 or 3 feet between the ship and the daylight, then sunk again like a porpoise. I hove about to try again, but on further thought I gave out, knowing that as soon as it was light the ships' boats would be rowing in all directions, and I thought the best generalship was to retreat as fast as I could, as I had 4 miles to go before passing Governor's Island. So I jogg'd on as fast as I could, and my compass being then of no use to me, I was obliged to rise up every few minutes to see that I sailed in the right direction, and for this purpose keeping the machine on the surface of the water and the doors open. I was much afraid of getting aground on the island, as the tide of the flood set on the north point.

While on my passage up to the city, my course, owing to the above circumstances, was very crooked and zigzag, and the enemy's attention was drawn towards me from Governor's Island. When I was abreast of the fort on the Island, 3 or 400 men got upon the parapet to observe me; at leangth a number came down to the shore, shoved off a 12 oar'd barge with 5 or 6 sitters and pulled for me. I eyed them, and when they had got within 50 or 60 yards of me I let loose the magazine in hopes that if they should take me they would likewise pick up the magazine, and then we should all be blown up together. But as kind Providence would have it, they took fright, and returned to the island to my infinite joy. I then weathered the Island, and our people seeing me, came off with a whale boat and towed me in. The magazine, after getting a little past the Island, went off with a tremendous explosion, throwing up large bodies of water to an immense height. . . .

—Johnston, "Sergeant Lee's Experience," pp. 264–65.

A week later a second try on the *Eagle* proved fruitless, as did a subsequent attempt on a British frigate. Despite these failures, Bushnell earned himself the title "father of submarine warfare."

Advancing enemy control of Manhattan and the surrounding waters, coupled with the continuing problem of currents, made further submarine efforts too risky. Bushnell tried to transport the *Turtle* back to Connecticut on board a sloop; but the British discovered him, and with a few well-placed cannonballs sank the vessel and its precious cargo. Though he later recovered the sub, Bushnell never used it again because of his own poor health, a lack of funds, and the lengthy training period required for operators. Washington later said of Bushnell's venture: "It was an effort of genius, but . . . too many things were necessary to be combined to expect much from the issue against an enemy who are always upon guard."[21] In 1777 Bushnell made two other attempts at utilizing explosives in the water but did not employ a submarine. His proven ingenuity won him the hearty endorsement of Governor Trumbull for the companies of sappers and miners,[22] which he joined in 1779.

By mid-October 1776 the Americans seemed about to be cut off from behind by one of Howe's favorite flanking movements. In a now-familiar pattern, Washington moved his men still further north, this time to White Plains in Westchester County. Washington left a garrison behind at Fort Washington to defend the line of obstructions stretching across the Hudson from Fort Lee, New Jersey.

When he moved to White Plains Washington needed to know what the enemy was doing. He ordered his Chief Engineer to find out. Putnam had conducted surveys and reconnaissance missions before, although seldom under such dangerous circumstances. Putnam described this particular assignment in an excerpt from his memoirs. When he stole into White Plains itself on October 20, Putnam recalled in another passage, "I was induced to disguise my self by takeing out my cockade, Loping my hat and Secreating my Sword and pistols under my Loose coat, and then had I ben taken under this disguise the probability is that I Should have ben hanged for a Spy."[23]

10. "I . . . DISGUISED MY APPERENCE AS AN OFFICER AS FAR AS I COULD"

From Rufus Putnam's memoirs.

October 19th 1776—The British Landed on Pells point and Some Skirmishing to[ok] place in the afternoon. . . . The next morning by ordor of the general I Set out from Kingsbridge, to reconnoiter there Position, etc. I Set out in company with Colo. Reed the adjutent general and a foot guard of about 20 men. When we arrived on the hights of East Chester we Saw a Small body of British neer the church, but we could obtain no intiligence, the Houses were diserted.

Colo. Reed now told me he must return to attend issuing general orders. I observed that we had made no discovery yet of any consequence, that if he went back I wished him to take the guard back for I chose to go alone.

I then disguised my apperence as an officer as far as I could, and Set out on the road to White plains. However, I did not then know where White plains was, nor where the road I had taken would carry me. I had gon about 1 ½ mile, when a road turned off to the right, I followed it prehaps ½ a mile and came to a house, where I lerned from the woman that this road Lead to New-Rochell that the British were there and that they had a guard at a house in Sight. On this information I turned and pursued my rout toward White plains (the houses on the way all deserted) untill I came with 3 or 4 mile of the place. Here I discovered a House a little a head with men about it by my glass I found they were not British Soldiers, however I approached them with caution. I called for Some oats for my horse, Set down and heard there chat Some little time, when I found they were frinds to the cause of America and then I began to make the necessary enquieries—and on the whol I found that the main body of the Brittish Lay neer New Rochelle. From thence to White plains about nine mile, good roads and in general level open country that at white plains was a large quantity of Stores, with only about three hundred melitia to guard them, that the British had a detachment at Maniarneck only Six miles from White plains, and from White plains only five mile to the North River, where lay five or Six of the enimies Ships and Slops, tenders, etc.

Having made these discoveries I Set out on my return. The road from Wards acros the Brunx was my intended rout unless I found the Brittish there, which happly they were not, but I Saw American on the hights west of the Brunx, who had arrived there after I passed up.—I found it to be Lord Sterlings Division. It was now after Sunset. I gave My Lord a short accont of my disoveries took Some refreshment, and Set off For head quarters, by the way of Philips, at the mouth of Sawmill river, a road I had never traveled, among tory inhabitence and in the night. I dare not enquire the way, but providence conducted me.—I arrived at head Quarter neer Kings bridge (a distence of about 10 mile) about nine oClock at night. I found the General alone. I reported to him the discoveries I had made, with a Sketch of the country. He complained very fealingly of the Gentlemen from New York from whome he had never ben able to obtain a plan of the country—that from there information he had ordored the stores to White plains as a place of Securety.—The General Sent for General Greene, and genl. George Clinton. . . . As Soon as General Clinton came in my [s]ketch and Statement was Shewn to him and he was asked if the Sittuation of those places were as I had reported.—Genl. Clinton Said they were.

—Buell, *Memoirs of Putnam*, pp. 61–63.

Howe characteristically delayed attacking, giving Putnam the opportunity several days later to entrench on Chatterton Hill overlooking White Plains. On the 28th of October the British finally took Putnam's earthworks, while Washington slipped away to North Castle and hastily erected new works.[24] "These, to the enemy, in whose view they fully were," recalled Maj. Gen. William Heath, "must have appeared very formidable, although they were designed principally for small-arms."[25] Heath further described the latest American defenses:

> There were the stocks of a large cornfield at the spot: the pulling these up in hills, took up a large lump of earth with each. The roots of the stalks and earth on them, placed in the face of the works, answered the purpose of sods or fascines: the tops being placed inwards as the loose earth was thrown upon them, became as so many ties to the work, which was carried up with a dispatch scarcely conceivable.[26]

As Chief Engineer, Putnam assisted again by "examining the nature of the country in a military point of view."[27] For whatever reasons—and the formidable appearance of the rebel position surely was one—Howe failed to attack Washington's new position, decamped, and marched southwest. Isolated Fort Washington was his goal.

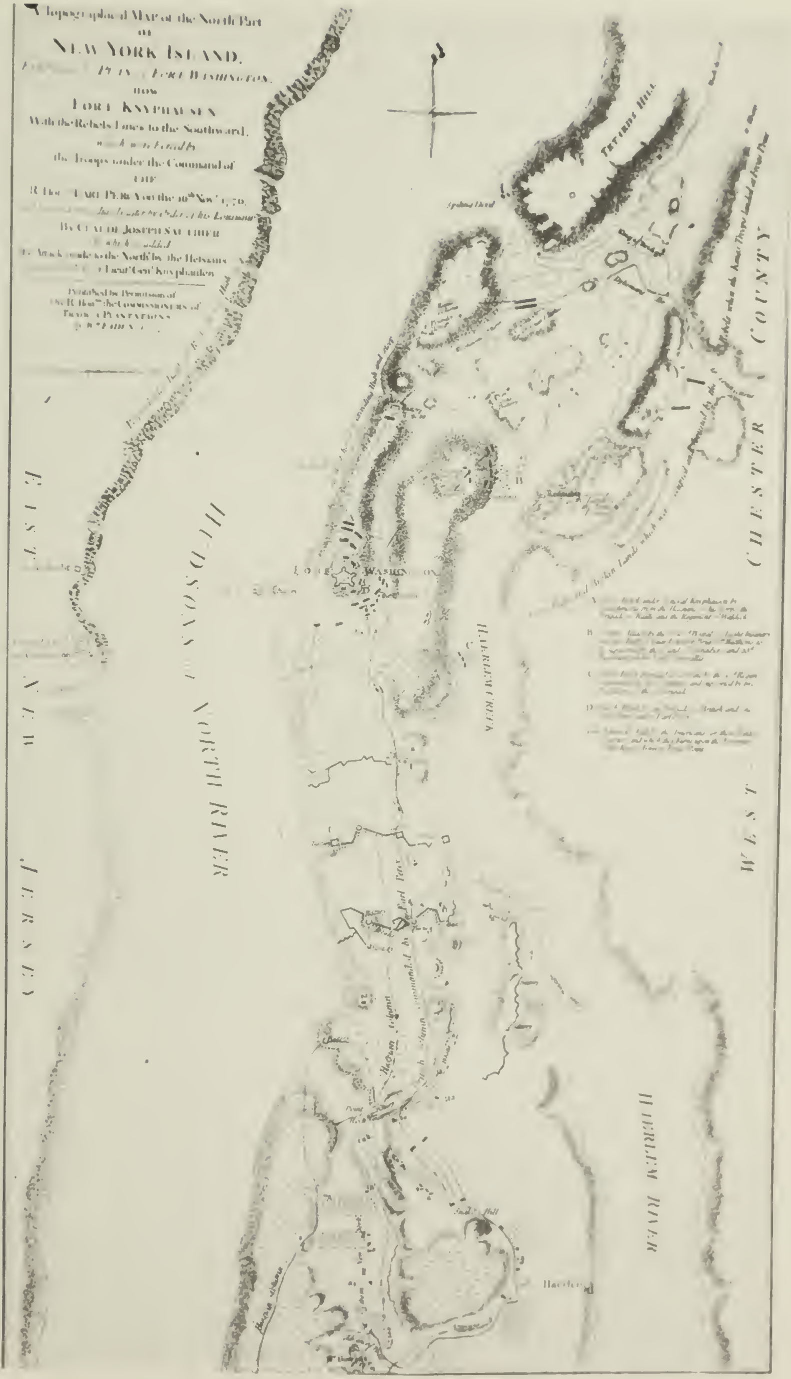
Throughout November Washington maintained the post at Fort Washington largely on assurances from General Greene that it could be held and, if necessary, safely evacuated. For their part the British assumed the fort to be strong. Their decision to take it was based on reports of dissension among the troops and not on any perceived weakness of the position.[28]

Appearances were deceiving. Though located on a bed of rock nearly 200 feet above the Hudson, Fort Washington was actually rather weak. In July Putnam had laid out the fort and directed its construction but made no effort to strengthen the position by blasting the underlying rock. The main fort was a five-sided earthwork lacking a fraise, ditch, barracks, casements, and a well. Moreover, the outworks were incomplete and the citadel could easily be besieged. The fort and surrounding batteries mounted thirty-four cannon and a pair of howitzers.

A series of earthworks protected Fort Washington to the south where an infantry approach was easiest. Additional redoubts lay to the north and east. Another redoubt at Jeffery's Hook, planned by Antoine Felix Wuibert de Mézières, a French volunteer serving as an Army engineer, defended the western edge of the position.[29] If the outworks fell, the rebels planned to retreat to the main fort as a last resort.

NORTHERN MANHATTAN ISLAND, NOVEMBER 1776. *This British plan of the American position around Fort Washington,* center, *and the route of the Hessian attack shows that south of the main fort were extensive batteries, surrounded by abatis, and the rebels' winter barracks.*

Courtesy New-York Historical Society, New York City


Topographical MAP of the North Part
of
NEW YORK ISLAND.
FORT WASHINGTON
now
FORT KNYPHAUSEN
With the Rebels Lines to the Southward,
the Troops under the Command of
the Lieut. Gen. Knyphausen
EAST NEW JERSEY
HUDSON'S or NORTH RIVER
WEST CHESTER COUNTY
HARLEM CREEK
HARLEM RIVER
FORT WASHINGTON
Harlem

Near dawn on 16 November 1776 Washington crossed the Hudson from Fort Lee with Generals Israel Putnam, Nathaniel Greene, and Hugh Mercer, to decide the fate of Fort Washington once and for all. The British were known to be advancing toward the fort, but upon landing the generals learned that Hessians were at that moment attacking the outer lines. Fearing for their safety, the officers returned to Fort Lee and awaited the outcome. Before nightfall Col. Robert Magaw, commander at Fort Washington, surrendered. The British took valuable materiel and more than 2,800 prisoners, among them engineer Wuibert.

By November 20 the British controlled Fort Lee as well. Closely pursued by Lord Cornwallis, Washington's army began a retreat across New Jersey that ultimately led over the Delaware River at Trenton into Pennsylvania. The loss of entrenching tools at Fort Washington prohibited construction of earthworks. Nevertheless, Washington's men placed obstructions in the path of the British and destroyed bridges wherever possible. And before Washington crossed into Pennsylvania, he ordered all boats in the vicinity gathered up in an effort to hinder Cornwallis's pursuit.

Though it was nearly winter, Washington was not content to end the campaign of 1776. The loss of Fort Washington haunted him, and he feared British designs on Philadelphia, not to mention sagging patriot morale. Accordingly Washington planned a bold move to retake western New Jersey by coordinated surprise attacks on British positions at Trenton and Bordentown, outposts Cornwallis had established earlier in December before going into winter quarters at New Brunswick.

Christmas night Washington again called on Glover's Marbleheaders, this time to ferry the 2,400 men in his main force across the Delaware at McKonkey's Ferry north of Trenton. Glover's task was a difficult one, the river being choked with ice. Worse still, winds battered the area and a blinding snowstorm developed before morning. Glover's experienced sailors and fishermen manned Durham boats—black river vessels resembling large canoes. Eighteen-foot oars propelled the boats downstream, while the oarsmen used poles to move upstream. The amphibious operation was a remarkable success, particularly in the movement of eighteen heavy artillery pieces without loss. (Two simultaneous attempts to cross farther downriver failed, in one case because the artillery was too heavy.)

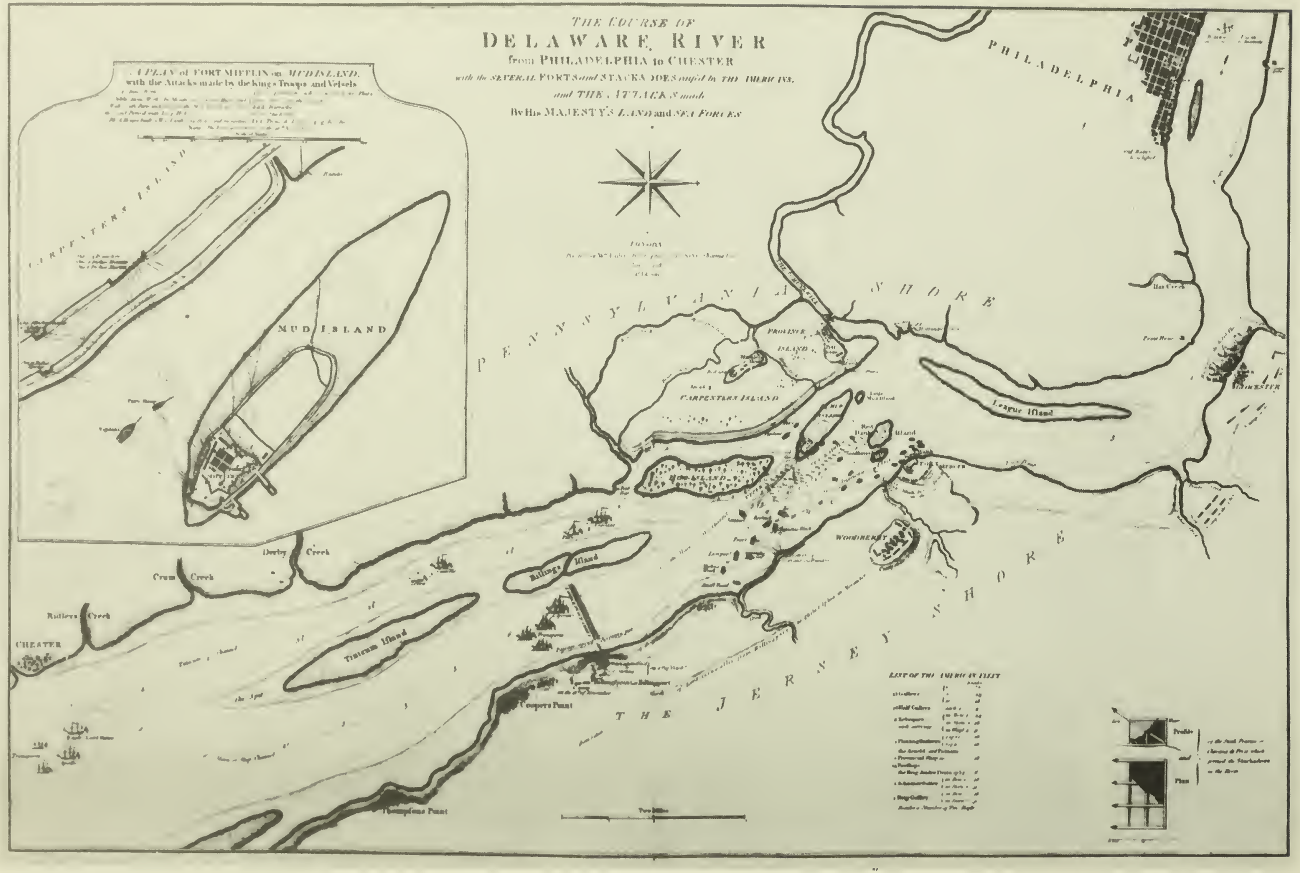
Though aiming for midnight, Glover's men understandably completed the crossing three hours late. The Marbleheaders then joined the rest of Glover's brigade to march the nine miles to Trenton with Washington. There the rebels surprised and overwhelmed the poorly entrenched Hessian garrison. By helping to cut off the enemy's retreat, Glover's men proved their ability on land as well as on water.

On the night of the 26th, the weary Marbleheaders ferried about 950 Hessian prisoners and the victorious American forces back to the Pennsylvania side of the river. Weather conditions that night were even worse. When the operation was over, Glover's men collapsed from exhaustion.

Washington's troops and artillery crossed the ice-jammed Delaware to New Jersey again on December 30 and 31. This time Washington hoped to solidify his position at Trenton and drive the British farther east. At first he massed his army at Trenton and placed earthworks along the Assunpink Creek and north of the town. Cornwallis, boasting that he would soon "bag the fox," moved into Trenton. But on the night of 2–3 January 1777, Washington left his campfires burning and stole toward Princeton, where the next morning he surprised the enemy and gained control of the town.

Although Washington wanted to go on to New Brunswick, his men were too tired. Sorely disappointed at his inability to take action he felt might have ended the war, Washington established winter quarters at Morristown. He was heartened, however, that his bold actions had breathed new life into the American cause. By the 10th, Howe had withdrawn all his troops to New Brunswick and Amboy. The campaign of 1776 was over.

The patriots lost New York in 1776 but still held Philadelphia. For how long no one could be sure. Enemy control of New York City made security of the Hudson Highlands upriver an American priority. For the remainder of the war, Washington dreamed of retaking New York. He never succeeded.


THE COURSE OF
DELAWARE RIVER
from PHILADELPHIA to CHESTER
with the SEVERAL FORTS and STACKADOES erected by THE AMERICANS.
and THE ATTACKS made
By His MAJESTY'S LAND and SEA FORCES
A PLAN of FORT MIFFLIN on MUD ISLAND,
with the Attacks made by the King's Troops and Vessels
MUD ISLAND
CARPENTERS ISLAND
PHILADELPHIA
PENNSYLVANIA SHORE
PROVINCE ISLAND
League Island
Red Bank
Woodberry
Billings Island
Tinicum Island
Derby Creek
Crum Creek
Ridleys Creek
CHESTER
Coopers Point
Thompsons Point
THE JERSEY SHORE
LIST OF THE AMERICAN FLEET
Profile
Plan
Two Miles

Chapter VI

A HEROIC DEFENSE: THE PHILADELPHIA CAMPAIGN, 1777–1778

General George Washington spent the spring of 1777 trying to guess William Howe's next move. Would Howe at last advance toward Philadelphia, or would he sail up the Hudson to join Burgoyne at Albany? Though the latter course seemed most likely, Washington prepared for both possibilities. For his part Howe complicated Washington's quandary by remaining unseasonably long in New York.

Finally on July 23 Howe moved out with a fleet of 260 ships and nearly fifteen thousand men. The fleet's movements perplexed Washington. First, on the 29th, it appeared off the Delaware Capes, but then it turned about and sailed for Virginia. Attempting to anticipate Howe, Washington's army was "compeld to wander about the country like the Arabs in search of corn."[1] Only in late August when Washington heard that the British fleet had been sighted in the Chesapeake Bay did he feel confident that Philadelphia was Howe's objective.

Fearing British naval strength but never expecting an attack on Philadelphia from the west, Pennsylvanians had concentrated their defenses on the Delaware River just below the city. In 1775 they established a navy and began fortifications. They strengthened an unfinished star fort on Fort Island that the British had started under the direction of John Montresor during the French and Indian War. Pennsylvania's defense plans also included sinking chevaux-de-frise in the Delaware, an operation which was begun in September 1775 and continued until the British arrived two years later. The chevaux-de-frise used in Philadelphia were large box-like containers, about thirty feet square. The bottoms were floored to hold stone ballast; the sides were covered with logs. Posts mounted with iron spears were attached to the upper parts and faced downriver. Chains stretching across the river held the structures together.

THE DELAWARE RIVER FROM PHILADELPHIA TO CHESTER. *This map from William Faden's* Atlas of the American Revolution *shows the placement of American fortifications, river obstructions, and vessels in 1777.*
National Archives

Attention to the river defenses fluctuated between 1775 and 1777, depending on the perceived threat of British attack. By early spring 1777 the citizenry was sufficiently alarmed to renew its defensive efforts. In February work began at a site downriver at Billingsport, and in April a fort was started at Red Bank.

Until June 1777 local men without experience or training in military engineering planned and executed the Delaware River defenses. Then Maj. Gen. Philippe Charles Tronson du Coudray, the controversial Frenchman recruited by Silas Deane to command the engineers, surveyed the defenses for the Continental Congress. His report to the Supreme Executive Council of Pennsylvania was extremely critical. He found Billingsport the preferable position, but the plan "very bad" and the execution of the works "without Judgment." The principal role of Billingsport, Coudray argued, should be to defend the chevaux-de-frise, and he recommended substantial changes toward that goal.

Coudray virtually dismissed Fort Island; and while declaring Red Bank "better conceived, directed, and executed" than either of the other two forts, he considered it useless for obstructing passage up the river. Coudray's advice to preserve Red Bank, despite its shortcomings, demonstrated a noteworthy appreciation for politial considerations.

1. COUDRAY'S OBSERVATIONS ON THE DELAWARE RIVER DEFENSES

To the Pennsylvania Supreme Executive Council.

July 1777[2]

Fort at Billingsport

1. As to the Situation, it is well-chosen, it commands the River in the narrowest Part I have seen, and is the most capable of Defence.

2. As to the Plan or Projection, it is very bad. The Object in View ought to have been to defend the Chain of Chevaux de Frize, which bar the River. For that Purpose 30 or 40 Cannon, well placed, would have been sufficient. The Edge of the Scarp would have afforded room enough; it was therefore necessary to shut the Gorge of the Battery, so that the Enemy might be obliged to land and open Trenches, in order to take Possession of it. . . .

Besides the Length of Time, which the Plan of this Work would require in the present situation of Affairs, another Inconvenience attends it, which is, that it would require for its Defense, a more numerous Garrison than could be spared from the Army. For it would require at least 2000 Men; as, from the Badness of the soil, the Enemy's Cannon would soon make great Destruction, which must be repaired every Night, to prevent the works from being stormed.

3. As to the execution of these Works, I find it to be without Judgment. The Planks and Piles to support the sand are not half thick enough. The Piles instead of being inclined to bear against the Bank, have been fixed perpendicular and are already overturned. Instead of placing the Batteries destined to fire on the River, on the Border of the Scarp, they have placed them 7 or 8 Fathoms back, which removes them farther from their Object, and exposes them to the Enemy's attempt at the Bottom of the Scarp. And suppose the Works completed, only one Piece of Cannon can do Execution. Instead of making use of the Ground which forms the Border of the Scarp and which is firm on the superfices, and supported at least for some Depth by the Roots of Trees which grew there, they have raised a great Part of the Breastwork with loose Sand in the manner before mentioned, and have taken the Trouble to sink a Ditch, which might have been spared as the Scarp answered the Purpose. . . .

To defend the Chain of Chevaux de Frize which bars the River opposite to the Fort, all dependence for the present must be on the Floating-Batteries and Gondolas which are ready, or which can soon be so. Some use, however, can be made of a Part of the Fort, of which we have been speaking: and for this Purpose there should be a Battery fixed in each of the two Demi-Bastions on the side of the River. And by cutting those two Demi-Bastions by the Gorge and the angle of the Flank, they will each be transformed into a Redoubt with four Fronts. Each of these Redoubts may be secured against a Coup de Main by covering them with a double Ditch and Pallisades in the Bottom of the Ditch. It will then be necessary to level all those Parts of the Fort which may serve to cover the Enemy. These two Works by means of 1500 or 2000 Labourers well directed may be executed in 20 Days: and in my Opinion this is all that can be done in the present situation of affairs. . . .

The Fort

The Fort [Mifflin] is badly situated; the Battery which forms its principal object is improperly directed, which renders Half the Guns useless. The Embrazures are badly constructed, too open on the inside, and not sufficiently open without: some are directed obliquely without any motive; the interior Slopings are too straight, and by this means begin already to tumble down.

This Fort cannot prevent the Passage of the Enemy, and when they have passed, it can be of no use; consequently it can answer no valuable Purpose.

Fort of Red-bank

This Fort is better conceived, directed, and executed than either of those above mentioned. It does the more Honour to Colonel Bull,[3] as he had no other assistance than natural good sence unenlightened by Theory. This is perceivable from a View of it. There are indeed Faults in the Plan, and in the Execution, but they do not render it useless as the two former Forts. If we may judge by the Proportion of the work already finished, it is reasonable to expect the whole will be in a State of Defence in the course of a Fort night. What unfortunately renders this Fort of little or no Consequence is this; its object is, and can be, no other than to prevent the Enemy from taking possession of the Highth upon which it is placed, in order to establish Batteries and thereby oblige the Gallies and Floating Batteries employed in supporting the Chain of Chevaux de Frize, to retreat. But this case could never happen, unless the Enemy should be exposed to a Fire from the Floating Batteries and Gallies, which they could not silence with their ships. . . . But the situation of the Place will not permit such an idea; for the River is here so wide that if the States had four times as many Gallies, Ships and Batteries as they have at this place and above it, the Enemy, we must think, would still have a superior Fire, as the width of the River would allow them to employ a greater number of Ships. . . . Therefore I look upon this Fort as useless with respect to the Object for which it was intended, viz., to contribute in obstructing the Passage of the River, and preventing the Enemy from possessing the Highth it commands. This Passage is much too wide to be defended by the present means. I would therefore advise to carry all the means of Defense to the Passage at Billingsport. This place is incomparably more capable of support, and it is better to make a respectable stand in one place than to defend two in an indifferent manner. . . . The River [is] much narrower in this place than in that of which we have been speaking. The Gallies and Batteries may more easily make Head against the Enemy who will not be able to make so great a Fire, and will be obliged to bear a much nearer one, and better supported, than could be opposed to them at Red Bank. The Cannon at this Fort might partly serve for the Batteries at Billingsport. I would not, however, advise to demolish the Battery at Red Bank, but to leave there two or three of the poorest of the Cannon.

I would also advise to remove from this Line no more Chevaux de Frize than would be judged necessary to secure by three Rows, the Passage of Billingsport.

I also advise to preserve Colonel Bull's Fort [Red Bank]. Thereby you may induce the Enemy to believe they would have a second Line of obstacles to encounter, after they had surmounted the first; and besides for another Reason, which appears to me a very important one especially in the present Circumstances of Affairs, the Government would escape the Censure inconsideration and mistakes, which the evil-minded are always ready to pass, and the People to adopt, when they see Works which have been erected with much Labour and Expense pulled down. . . .

—***Pennsylvania Magazine***
24:343–47.

After reviewing Coudray's plans, the Continental Board of War recommended that the Pennsylvania council adopt them. But as Howe's designs on Philadelphia became clearer, Washington directly entered the picture. He required opinions on the river defenses from several officers, the majority of whom acknowledged that Billingsport and its line of chevaux-de-frise could not withstand attack. Washington's advisors felt the chevaux-de-frise at Fort Island, despite the fort's weakness, could be more easily defended than the line at Billingsport.

In a statement to Washington, Coudray held firm in his preference for Billingsport and, with some exasperation, again urged speedy action by the "Civil and Military administration" to supply the needed manpower and tools. He offered his services and those of his men to ready Billingsport, Red Bank, and Fort Island, which he began calling Fort Mifflin in honor of his friend and associate, Thomas Mifflin of Pennsylvania.

2.COUDRAY CALLS FOR ACCELERATION OF THE DELAWARE RIVER FORTIFICATIONS

August 6, 1777

. . . It is necessary to procure some remedy for the present weakness of the first line, by putting ourselves in a State of protecting the second and of giving thereby time to the army to arrive.

I offer to continue in this respect my care and that of the commissioned and non Commissioned Officers who attend me; but if his Excellency intends that their care should not be useless, and that an invincible disgust should not succeed the most ardent zeal, it is absolutely necessary to cause a change in the conduct, which has been observed hitherto, and to accelerate the slowness of the Civil and Military administration, to which the Congress addressed us, to procure the means of execution.

It is necessary . . . that the Honourable Congress themselves order without delay. *1st.* A Thousand *effective* Workmen every day for Billingsport who are to work on holy days, and Sundays, under the proper direction of the Engineers whom I have there. *2nd.* The necessary tools, as well for these Workmen, as for my Artillery Workmen, whom I shall employ to construct the Batteries, and to repair the Carriages intended either for this or Mifflin Fort in the actual circumstances; those that I keep at Billingsport and here for this purpose having not yet been able in spite of my repeated solicitations to obtain this month past neither all the tools they want nor even Clothes. *3rd.* 200 other Workmen every day at Fort Mifflin and an hundred at Red bank under the same conditions with the former. Provided this request be granted, I engage to put these three places in a State of defence in the course of this Month. Viz., to be defended Billingsport with 400 Men and 80 Cannoniers; Fort Mifflin with 600 and 500 [50?] Cannoniers, Red bank with 200 Men and 20 Cannoniers.

> During the same time, I shall employ the rest of my Engineers to execute suitably to the examination of the five places of encampment to be taken between Marcus Hook and Philadelphia . . . .
>
> I ask for these Engineers no other assistance, besides the horses, and a Man to serve them and carry their instruments. . . .
>
> **—Washington Papers, roll 25.**

After personally inspecting the fortifications and sifting the advice of his staff, Washington concluded in early August that the most effective defense could be made at Fort Island. He recommended defending Billingsport only "as a secondary object" and rightly maintained, as had Coudray, that the army should focus its defense "at one point, rather than risk its being weak and ineffectual every where, by dividing our attention and force to different objects."[4] On the other hand, Washington rejected Coudray's argument that the narrowness of the river at Billingsport was a crucial consideration. Washington agreed that the existing works on Fort Island were inadequate and accordingly recommended immediate alteration. Though their views differed, Washington entrusted Coudray with superintending the work.

The day after Washington reported to Congress, Coudray wrote him: "It is beyond all dispute, that the situation of Fort Island is more advantageous than that of Billingsport."[5] Very likely Coudray backed down purposely to conform to Washington's views. The Frenchman still emphasized the need for speed and insisted that Howe would approach Philadelphia from the Delaware River. Without orders from Washington, Coudray and four engineers surveyed and mapped Fort Island and then volunteered to do the same at potential British landing sites between Marcus Hook and Philadelphia, a task Coudray later completed.

That Coudray never really accepted the arguments favoring Fort Mifflin was apparent in a memoir he prepared on 30 August 1777. His soundings of the river had convinced him that the claim Fort Mifflin could only be attacked by three frigates at a time was erroneous. The figure was more like fifteen. Such a flotilla, the Frenchman warned, could demolish the fort in a matter of hours unless it was strengthened. He believed the improvements and supplements to Fort Mifflin that were required to defend the chevaux-de-frise adequately would be too costly and time-consuming. "Unless . . . some reasons regarding particularly the State of Pennsylvania or the future operations of the Army" required lengthy resistance to enemy attack, Coudray maintained, no thought should be given to defending the river passage at Fort Mifflin.

If Congress would support his plan to finish Billingsport, Coudray would hire workmen rather than militiamen on a daily basis. The move would cut costs, he argued, because workmen "will work a great deal more and not consume such an immense quantity of tools of all kinds."[6]

As a consequence of the debate over defending Fort Mifflin or Billingsport, the army made little progress in fortifying either site during the summer of 1777. Attention shifted temporarily away from the Delaware on August 25 when Howe landed at Head of Elk on the Chesapeake. Philadelphia lay fifty-seven miles away. The road there would not be an easy one, for Washington was determined that Howe would not take Philadelphia without a struggle.

Coudray and his French officers were eager for some action that might gain them recognition from Congress and demonstrate their zeal for the American cause. They were particularly concerned lest Congress show favoritism toward the rival group of French engineers headed by Col. Louis Lebègue Duportail. Tension had existed between the two groups ever since Duportail first reported to Washington on July 19. Although Washington used Duportail's engineering skills in the Philadelphia area, he was careful at this point not to allow Coudray to be upstaged.

Coudray's proposals for defense against the approaching enemy centered on the need for a fortified camp between Philadelphia and Wilmington, Delaware, where Washington had based his operations. He viewed the new position as security for the army in case Wilmington had to be abandoned or Philadelphia was lost. Coudray's experience as an artillery and ordnance officer was evidenced in lengthy comments (not included in the following excerpts) backing up his contention that "artillery is the foundation of all defensive war."

3. "THE OBJECT THE LEAST PRESSING IS THE DEFENSE OF THE DELAWARE"

Tronson du Coudray to Congress.

Philadelphia, 7 September 1777

. . . It is evident that from the part which the ennemy have taken of making a descent in Cesepeak bay, the object the least pressing is the defense of the Delaware.

This being supposed, it is clear that the greatest attention ought to be directed to defend as well as possible, the Route which the Enemy have determined upon, by their landing in Chesapeak.

It is certain that fixing on this spot to land [Head of Elk], instead of Mark's hook (which General Gates, Mifflin, and myself thought they would chuse) will encrease considerably the Posts, which in proportion as they advance in the Country, they will be oblig'd to establish to keep up a Communication with their fleet. But the greatest disadvantage attending this, gives not however an entire certainly against the success of their march to Philadelphia, which I always judged and declared, since my arrival here, to be the true object of their Campaign.

To ensure, as much as possible, the success of this Campaign, it is necessary not to be merely contented with securing the Position of Wilmington, where his Excellency has very wisely thought proper to collect his first Efforts.

However strong this position may be supposed by nature, or may be rendered by Art; it appears to me, after what I have heard, that it will be possible for the enemy to pass it on the flank, or perhaps force it; considering especially the small number of Artillery belonging to his Excellency's army.

It appears to me then prudent for Congress to think of providing beforehand for their army, another fortyfied Position, which may secure the army in case they are obliged to abandon the first, and where they may collect new force against an enemy, whom the first success may render more audacious; more especially as Schuylkill is the only considerable river that impedes their March to Philadelphia; and that this River offers at Grays-ferry a Passage which no officer can (I should think) propose to defend.

For this purpose, I offer again my service and that of my officers; in hopes that there will result from it an opportunity of our being in action, which the delay of Congress in pronouncing definitively upon our existence in the service of the United States, always removes at a distance, and which probably we might wait for in vain at the forts on the Delaware; at least before our return in France, should this take place. If the Congress consent to the proposition which I make, to prepare a fortified Camp between Wilmington and Philadelphia, I beg them [*First*] to communicate this proposition to his Excellency General Washington.

[*Second*] To give me, as a principal cooperator, General Mifflin, who knows perfectly well this country; who has a very great ascendant over the Inhabitants, by whom the works would be executed and whose great activity and penetration I have had occasion to observe.

[*Third*] To bring forward, as soon as possible, the remainder of the fifty two pieces brought in the *Amphitrite,* of which twelve alone are in the northern army, ten, within these few weeks, at the army of his Excellency General Washington; the rest in Springfield, and, at other Places on the east side of Hudson's River.

These thirty remaining pieces of the said fifty two, will be so much the more necessary, as artillery is the foundation of all defensive war; and that of these thirty pieces, there are twenty one which being of a greater length than the others, and even any pieces in the army, are for that reason better for defending the intrenchments. . . .

—Ford, "Defences of Philadelphia," *Pennsylvania Magazine* 18:334–37.

Coudray, a keen and competent observer of the Delaware River defenses at a time when sound engineering advice was at a premium, died in mid-September, his plans largely ignored. Later that year, when the British finally did attack these defenses, few remembered his constant insistence that something be done before time ran out.

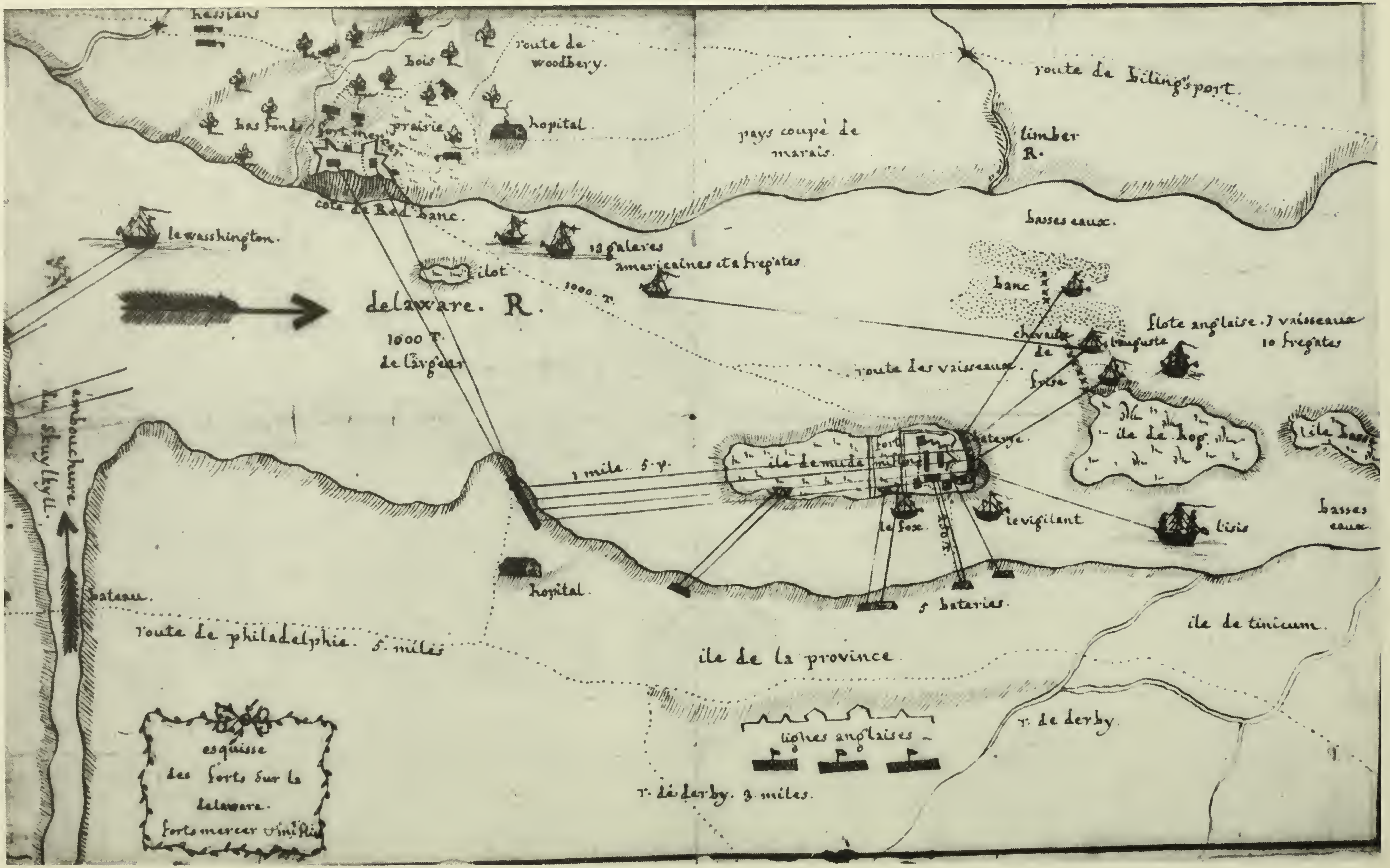
Howe's army took a month to get from Head of Elk to Philadelphia. At the Battle of Brandywine on September 11, Howe employed a turning movement reminiscent of Long Island to defeat the rebels. An important factor in the American loss was Washington's failure to order necessary reconnaissance. He did have a map of roads in the Brandywine River area, compiled earlier by James Brown, a surveyer employed by Robert Erskine, geographer of the Army; but more detailed information was required.[7] Still the enemy failed once again to destroy Washington's army, which was soon ready to take on the invaders.

After Brandywine the eventual British takeover of Philadelphia appeared certain, but the timing was hardly sure. In fact, through a series of maneuvers and skirmishes, Washington made the last twenty-six miles to the capital city exceedingly difficult ones for the British.

Washington spent little time erecting field fortifications during this part of the Philadelphia campaign; but, attempting to delay the British, he planned works at the fords of the Schuylkill River. Washington placed Brig. Gen. John Armstrong of the Pennsylvania militia in charge of the operation and on September 14 ordered Duportail and his officers to assist Armstrong as engineers. Washington did not need works that could withstand a long defense, he needed works that could be completed quickly and with little labor. "Only that part of them which is opposed to cannon, need be of any considerable thickness," he cautioned Armstrong, "and the whole of them should be rather calculated for dispatch than any unnecessary Decorations or Regularity which Engineer's are frequently too fond of."[8] Often fretful over the lack of competent engineers, Washington now complained that at least some engineers were too thorough!

Howe finally took Philadelphia on September 26 not by defeating Washington in battle but by outmaneuvering him. However, capture of the Quaker City was hardly a decisive blow to the patriots: far fewer Loyalists than expected came out in support of the British, Congress continued to meet in relative safety at Lancaster, valuable supplies had already been evacuated, and Washington's army remained intact. Less than a year earlier, Washington had envisioned that the loss of Philadelphia would have "the most fatal consequences to the cause of America,"[9] but now he accepted it as inevitable. News of Gates's success against Burgoyne at the First Battle of Saratoga (September 19) heartened Washington's men and lifted considerable pressure from them to rush to the defense of the Hudson.

The British quickly found that their occupation of Philadelphia was nearly meaningless without control of the Delaware River. Otherwise Howe


esquisse
des forts sur la
delaware.
forts mercer & mifflin
hessiens
route de woodbery
bois
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cote de Red banc.
le wasshington.
13 galeres
americaines et a fregates
ilot
1000 T.
delaware. R.
1000 T.
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fort
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le vigilant
l'isis
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hopital.
embouchure
du skuylkyll.
bateau.
route de philadelphie. 5 miles
ile de la province
ile de tinicum.
lignes anglaises
r. de derby
r. de derby. 3 miles.

had to rely on transporting supplies overland from Head of Elk, a perilous prospect indeed so long as Washington's army remained outside Philadelphia. Howe detached troops to clear the patriot defenses along the Delaware, but the task proved a long and difficult one.

Meanwhile, for the first time, Army regulars took over defense of the river forts from the militia. On September 23 troops under the command of Col. Heinrich d'Arendt, an officer in the German Battalion, garrisoned Fort Mifflin. Early the next month Washington placed Col. Christopher Greene of the 1st Rhode Island Regiment in command of Fort Mercer at Red Bank and assigned Captain Thomas-Antoine de Mauduit du Plessis, an artillery officer and engineer, to assist him.

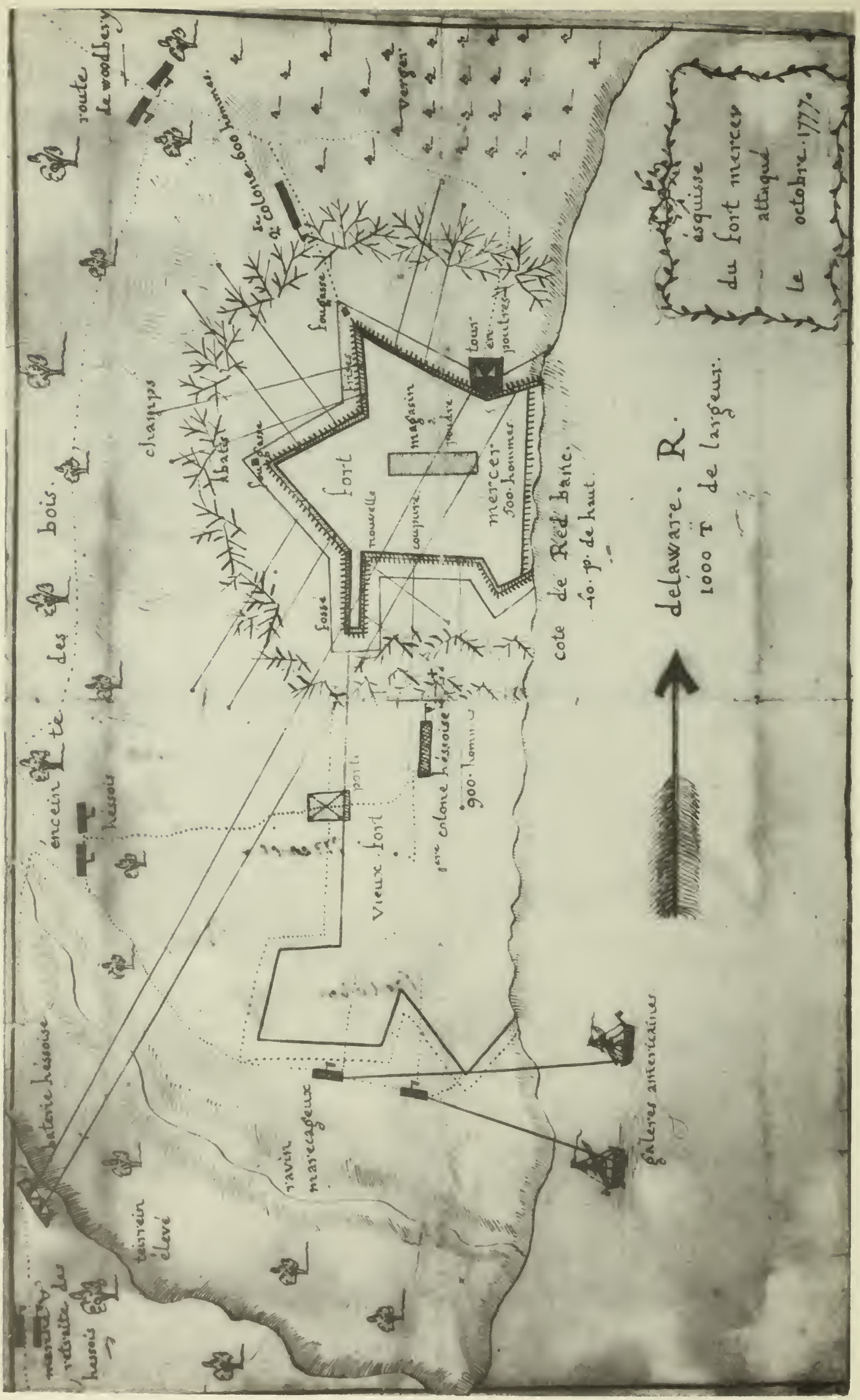
On October 2 the British took undermanned Billingsport without a fight. At that point "the Delaware defenses were there for the taking," but Howe proceeded cautiously after his near defeat at Germantown on the 4th.[10] Again his inaction bought more time for the rebels, who tried valiantly to strengthen their remaining defenses and maintain control of the Delaware. But conditions at Fort Mifflin, for example, had genuinely shocked Lt. Col. Samuel Smith, the second in command, when he arrived there on September 27. In the words of John W. Jackson, one modern-day authority, the works "reflected the lack of military engineering, and resulted in a fort more suited for frontier defense."[11]

Only a few days after Smith's arrival the British pressed forward with their own plans to reduce Fort Mifflin. They found that Province Island, situated just to the west of the fort, was not, as the Americans believed, an impossible location for batteries. Though the island could be flooded by removing dikes, enough high ground would remain for batteries. Accordingly the British placed several batteries on the island.

Across the river at Fort Mercer engineer Mauduit scaled the existing fort down to the size of the garrison by building a double-board fence filled with lumber and hay across the fort from east to west. This change helped the patriots turn back a Hessian attack on October 22. As a result of murderous gunfire from within the fort that day, Col. Carl von Donop, the Hessian leader, fell wounded and later died. Afterward, John Laurens, an aide-de-camp of Washington, praised Mauduit's labors at Red Bank: "[He] acquitted himself so well as to obtain panegyricks approaching to rapture from the officers who were witnesses of his conduct." Laurens maintained that Mauduit's alterations to Fort Mercer revealed that he "had not confined himself to one branch of military knowledge but had extended his studies with success to one which is generally held as a mystery apart [engineering]."[12]

DELAWARE RIVER DEFENSES. *This view of Forts Mifflin and Mercer and surrounding enemy positions was probably drawn by Fleury.*

Historical Society of Pennsylvania


esquisse
du fort mercer
attaqué
le octobre 1777.
route
de woodbery
2e colone 600 hommes
verger
encein te des bois.
hessois
champs
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fougasse
fougasse
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fort
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à
poudre
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coupure
tour
en
poutres
mercer
500 hommes
fossé
cote de Red banc.
40 p. de haut
delaware. R.
1000 T de largeur.
porte
vieux fort
1ere colone hessoise
900 hommes
baterie hessoise
ravin
marecageux
galeres americaines
terrein
élevé
marche de
retraite des
hessois

On 14 October 1777 François Louis Teissèdre de Fleury, a French volunteer and engineer captain in the Continental Army, arrived at Fort Mifflin as the post's engineer. His first assessment of conditions laid particular stress on what might have been accomplished before his arrival had there been enough men. Examination of the enemy's recently erected artillery positions convinced Fleury that Fort Mifflin was in grave danger.

4. "WE MUST HAVE MEN, WORKS, AND BE ENABLED TO MAKE VIGOROUS SALLIES"

François Fleury to Alexander Hamilton.

Oct. 16, 1777

The whole Front of the Fort now attacked is surrounded by Palisadoes, the Bank which ought to mask it is too low to cover it from the Battery placed on the opposite bank at the distance of 500 Yards—we might when the Enemy were quiet have raised this Causeway, clear'd the Ditche of the . . . Earth, and have secured our Inclosure if not from Ricochet at least from horisontal Shot—we might have arm'd our Battery (assailable in all points) by a sloped fraise work placed in a Ditch dug at low water in the Gravel—we might have added to the Fort an interior Inclosure of Earth and Blinds, in order to renew the Conflict with the Enemy in case they should posses themselves of the first—we might have made Loop-holes in the Barracks and Windows—Fougasses constructed in the manner of double Coffers or Lodgements—we might have raised Epaulements against the Cannon which might rake our place of Arms—and have formed Blinds to shelter us from Bombs and smaller shells—All this might have been done while the Enemy were intent upon their works which should have been destroy'd . . . but hands were wanting and now that we could have more to execute the same works under the Enemys Cannon, we have none—for what are 150 Men tired out with watching and Labours—had not this extreme Weakness prevented you might have heard of night Sallies in armed Boats to ruin the Enemys Works and spike their Cannon.

Since my arrival I have seconded as much as possible the zeal of Colonel [Samuel] Smith. We have raised three Traverses upon the grand Battery to guard against the Enemys Richochet that he has cover'd the

FORT MERCER, OCTOBER 1777. *This plan, made at the time of the Hessian attack, is attributed to François Fleury (1749–?). The fort was fraised and surrounded by abatis and a ditch. The solid line continuing to the left from the fort indicates the extent of the works as originally proposed.*
Historical Society of Pennsylvania

Powder Magasin with Blinds, and if we can to night we shall raise the Bank on the front attack'd to mask our Pallisadoes with this kind of a cover'd way.

Our greatest Uneasiness is occasioned by the dread of Surprise—the Channel between Pennsylvania and the Fort is altogether clear; the Galleys have removed the Jersey Side out of all distance for annoying the Enemy and seconding us. The nights are darken'd by Fogs and all our Garrison must be on the watch to avoid being carried by Storm—I am ignorant of the Plans of His Excellency [Washington]. I scarcely allow myself to form conjectures but if the thing required be to hinder the Enemy from reaching Philadelphia to cut off their Communication altogether, even in flat bottom Boats,—which might pass the Chevaux de frise and in a Channel at 1400 yds. dist. from Redbank (which Place is a mile and a quarter and five perches from Fort Island) our Battery alone can answer . . . what can you expect from Shot thrown at the distance of 1400 Yards against a moveable object? Red Bank . . . is to serve as a Retreat for our Garrison—but it wants no Retreat—its Refuge is in its Pallisades and its Courage. Let it be reinforced—let it be [?] put out of the reach of Storms—and the Enemy will not be so soon Masters of the River—but we must have men—works—and be enabled to make vigorous Sallies.

Position of the enemy—16 Octob: at noon—The Enemy have raised 4 Batteries—*One* a little behind the Fort upon the Bank which extends along the River at about 500 yards distance from us—a *second* at the Pest-House still more in our rear and at the distance of 2000 Yds.—*a third* at the Brick House (of which I spoke to His Excellency) situated on the rising ground opposite the Fort at 1 mile 28 perches from us. *A fourth* a little lower than the Fort—upon the Bank abovementioned there are besides two Batteries at the Mouth of Schuylkil which have made our Ships remove to a greater distance—there are 2 or 3 Mortars and some large Canon in these batteries—the Direction of their Fire was at first uncertain, but they have rectified it, and it appears to be . . . intended for our Powder Magasin.

—Washington Papers, roll 44.

Fortunately Fleury kept an informative and often moving account of his experiences at Fort Mifflin. The journal reveals his frantic efforts to upgrade the fort's defenses, a desperate need for more men, and a frustrating lack of materiel, including much that was essential to fortification. Enclosed in correspondence to Washington, Fleury's journal apparently served the Commander in Chief as an important source of information on developments along the Delaware.

5. "THE GREATEST PART OF THE BOMBS . . . OCCASION MORE FEAR THAN DAMAGE"

From François Fleury's journal.

Oct. 15 [*1777*]. At 8 in the morning, the Enemy unmask'd the two Superior Batteries of the Bank, and House. They produced no other effect than break[ing] three of our Palisades in half—battering down the Coping of the Buttress Work, and oversetting two Merlons. The greatest part of the Bombs extinguish'd by the humidity do not burst, and occasion more Fear than Damage—at noon they open'd the lower Battery on the bank.

15, night. Night pretty quiet except a slight Alarm caused by some Boats of the Enemys Fleet, which had reachd the point of [Hog] Island, and retired after firing upon the boats of our Galleys—a great Noise of Oars heard behind the Island. The cause of it unknown.

16, the day. The Enemy renew'd their firing this morning with Canon, and continued with Flourishes—their Design seems to be to make their shells burst in the air, on account of the little effect which the humidity of the Soil suffers them to produce. The few bombs which have been thrown for an hour past are intended to fall on our Roofs—some have gone through the two Floorings of our grand Barracks on the right and opposite as you enter, but destroy'd no Life—the Burst[in]g a Shell just now drives me from my Table. . . .

17, day. The Enemy fir'd upon our Barracks a part of the morning and unhappily about 9 oClock a Bomb kill'd two men and slightly wounded three others—The direction of the shells is not against the magasin in particular, but towards the middle of the Fort—the Bombs fall there, and the fires extinguish or they [go?] off without any mischief. . . .

18, the day. Fire renew'd deliberately but without Success—a few bombs upon our Barracks—some Shot from the pest House have broken two Palisades—they fire at 15 degrees elevation or thereabouts for their Shot fall in the manner of bombs. . . .

19, day. A little firing 'till noon—a large bomb from the pest House[13] *Crush*'d and set fire to a Ba[rrack]. It was extinguished immediately. So much for the Enemy.

Our own Transactions—

1. We have raised our Bank in the night time—an[d] our Pallisades on the Front attacked, are shelter'd from Cannon.

2. We have staged our Wall in order to flank the Side which the Galleys ought to defend.

3. We have join'd our Barracks by Ditches before the parapet in order to make a Second Inclosure.

4. We have raised a flank'd work in the middle of the Fort, made of Earth and Timber, and barrels fill'd with Sand, surrounded by a Ditch—to defend the Ground inch by inch.

5. We have raised some of the Embrasures.

N.B. Part of these works can only be carried on by night. The fire of the Enemy harrassing our Workmen by day.

The Battery is our vulnerable part, I would fraise it with Palisades—Col. Smith says we have neither materials nor hands—and he is partly right—but in its present Situation if it be attack'd, it will be carr[ied?] and our own Cannon may be turn'd against us.

The Galleys are on the Jersey Side. . . .

20. We repair'd 10 Palisadoes that had been destroyed by the Bombs—the elevation of the Bank defending them from Cannon Shot. The square work in the middle of the Fort is finished.

The Enemy appear to be raising a work at near a mile and a half from us at the point of Tinicum, in the direction of Hog Island—there are a great many people there—The Commodore [Hazelwood] who has been inform'd of it has not approached the Shore, but is gone to make a fruitless Cannonade against the Fleet.

The Enemy have kept up a heavy Fire, but happily have kill'd only two of our men and wounded one.

Evening. For want of Pickets, we have begun a Ditch to surround the Battery—to morrow night we shall endeavor to make a double Chain of floating Timber, or of Iron Chains taken from the Fire-Ships to hinder the Enemys Landing.

21. Scarce any Fire from the Enemy—I suppose there are few men in their Lines.

We stop't up all the old Loop-holes which were too low, and would have served the enemy as well as ourselves. We have made others too high for the Enemy to reach without, and have raised a Banquete for our men within.

The Enemy appear no longer in the direction of Hog Island at Tinicum point. The number of men seen there yesterday must have been a Disembarkation from their Fleet.

Night. No fire from the Enemy. We have driven down large Pickets in the bed of the River, at the distance of 20 feet from the Battery, and at the distance of 15 feet from each other—they are intended to support the double Chain spoken of above.

Part of the Chain is stretcht. The high Tide and Coldness of the night have hinder'd us from stretching the whole. We shall close the remaining Interval with floating Beams fasten'd together by their ends.

22. Firing from the Enemy—their Bombs have destroy'd some of our Palisades and we are employed in repairing them.

Night. The Chain which we have got is fix'd. The work is very difficult, on account of the necessity of performing it in the water. The Enemys

Vessels have got beyond the Bilingsport Chevaux de frise. Red bank is attacked.

23. Cannonade and incessant Bombardment from Day break—an Officer wounded—A large Vessel of the Enemy perferated with our Shots and those from the Galleys blew up. I know not by what accident. A second ran aground near the Jersey Shoar—The Enemys Vessels retreat. We are employed in making Traverses behind the Wall, to cover our Troops from their Fire. The East north East Block House blew up and render'd useless a Flank.

Night. I have traced a Ravelin for the defence of the outline flank'd by the Blockhouse—it will cover the Entrance and be of more use than the work which was there before. We have cover'd the left Flank of the Battery with two Parapets and two Ditches. We are deficient in wood, pickets and Earth.

24. We continue the Ravelin—make deepe Gaps in the Bank on the right and left to prevent the Enemy from advancing to the Attack in good order. Our Garrison is still very weak for so great an extent of Works.

The Enemy are silent on the land side, and in the River . . . .

The Enemy are employed this morning on a Work opposite the old Ferry. It appears to us to be a Battery and design'd to cover their passage to the Island—they have made but little progress with it as yet, and the Galleys might interrupt these if they plaesed.

26. No Firing from the Enemy—we discover men carrying fascines at the old Ferry—I can't form a Judgement whether their Design to erect some work there or prepare for a Descent here—The Commodore says he knows of several Boats being prepared on the Schuylkil. . . .

29. . . . in the morning the Tide added to the Storm and Rain broke our bank in several Places, especially near . . . the three half ditches which Baron Arendt order'd me to have made, near the house of the Barrack Master. This prodigious Inundation it is true puts us out of the reach of a Coup de main, the whole Island being under water, but it interrupts our Communications in the fort and causes among other Inconveniences, that of covering the ground adjacent to the Wall behind which we used to shelter our men from Bombs and Ricochet Shot.

Yesterday at 3 OClock we had a mind to make some Attempt upon the Enemy's Batteries overflow'd and unfit for Service—3 Galleys came to help us but the want of concert or deficiency of boats disappointed our Enterprise. The Result of which was only a few Cannon Shot from us and some Bombs thrown into the Fort. The firing ceased by mutual Consent.

The night has been quiet and the Tide more moderate. The same Tide which troubled us produced greater Derangement in the projects of the Enemy—Their Bridge over the Schuylkil was broke by it, and 12 of their Boats six of them large ones, with a number of Plank drifted to us. Their works on province Island appear but little Injur'd—except that they are in the water as we are.

I wish the Banks on province Island could be cut. I think the Enemy could not continue there.

30. No firing from the Enemy—they have strengthen'd their Bank Guards, and we observe frequent Patroles on the Banks. I have proposed to remove all the Earth which forms the old ferry bank, to render it impracticable as a Landing Place.

—Washington Papers, rolls 44 and 45.

In a letter to Washington, written October 28, Fleury poignantly expressed little hope of defending the fort against almost certain British assault. While lamenting the futility of works insufficiently manned, he assured the Commander in Chief, "we shall do all that can be expected of brave men."

6. "OF WHAT AVAIL ARE FORTIFICATIONS UNDEFENDED BY MEN"

François Fleury to George Washington.

28th October 1777

I have already written to you upon the Subject of my Fears respecting this Post.[14] I repeat that if the Enemy attempt it by way of storm and come provided with Fascines, Plank, Ladders, etc., 300 Men lost in a circumference of 1200 Paces cannot hinder them from penetrating, especially if they make false Attacks, and a real one in silence—You know this language is not dictated by Fear, but arises from a Sense of the importance of this Post. It is in vain to multiply works—of what avail are Fortifications undefended by Men.

The Galleys[15] which ought to be a Security to us are absolutely useless—they have withdrawn to the Jersey Shore—the Channel between us and Province Island is perfectly clear and if the Enemy choose to make a descent here as I have no doubt they do. We cannot hinder them. They may have two Projects one to take us by Storm and the other to open Trenches in the Island itself at the Extremity of Old ferry bank . . . we can hinder neither, but I am most afraid of the first. You know that the Fort has only weak Ditches and Palisades. The former are soon fill'd with Fascines, the latter easily cut away, and the Fort laid open. The Bombs have destroyed one of our Block houses. We depend upon a few Militia for the management of our Artillery, and the greatest part of it is useless for want of hands. Notwithstand such weakness we shall do all that can be expected of brave men—I have proposed to set fire to the Magasine in case they should penetrate and blow up altogether—but this is a desperate Resolution.

—Washington Papers, roll 145.

Writing his memoirs long after the war, Joseph Plumb Martin, who served as a private at Fort Mifflin in 1777 and later joined the sappers and miners, recalled the fort's condition upon his arrival late that October. As described in the passages below, the extremely muddy ground caused great hardships, and the enemy's incessant shelling made deathtraps of the barracks. As the siege progressed, the garrison was obliged to spend the nights repairing—under constant fire—damages the British cannonade inflicted by day. Fleury, the vigilant taskmaster, kept the garrison continuously at work.

7. "WE WERE, LIKE THE BEAVER, OBLIGED TO REPAIR OUR DAMS IN THE NIGHT"

From the narrative of Joseph Plumb Martin.

Well, the island, [Mud or Fort Island] as it is called, is nothing more than a mud flat in the Delaware, lying upon the west side of the channel. It is diked around the fort, with sluices so constructed that the fort can be laid under water at pleasure, (at least, it *was* so when I was there, and I presume it has not grown much higher since.) On the eastern side, next the main river, was a zigzag wall built of hewn stone, built, as I was informed, before the Revolution at the king's cost. At the southeastern part of the fortification (for fort it could not with propriety be called) was a battery of several long eighteen-pounders. At the southwestern angle was another battery with four or five twelve- and eighteen-pounders and one thirty-two-pounder. At the northwestern corner was another small battery with three twelve-pounders. There were also three blockhouses in different parts of the enclosure, but no cannon mounted upon them, nor were they of any use whatever to us while I was there. On the western side, between the batteries, was a high embankment, within which was a tier of palisadoes. In front of the stone wall, for about half its length, was another embankment, with palisadoes on the inside of it, and a narrow ditch between them and the stone wall. On the western side of the fortification was a row of barracks, extending from the northern part of the works to about half the length of the fort. On the northern end was another block of barracks which reached nearly across the fort from east to west.

In front of these was a large square two-story house, for the accomodation of the officers of the garrison. Neither this house nor the barracks were of much use at this time, for it was as much as a man's life was worth to enter them, the enemy often directing their shot at them in particular. In front of the barracks and other necessary places were parades and walks; the rest of the ground was soft mud. I have seen the enemy's shells fall upon it and sink so low that their report could not be heard when they burst, and I could only feel a tremulous motion of the earth at the time. At other times, when they burst near the surface of the ground, they would throw the mud fifty feet in the air. . . .

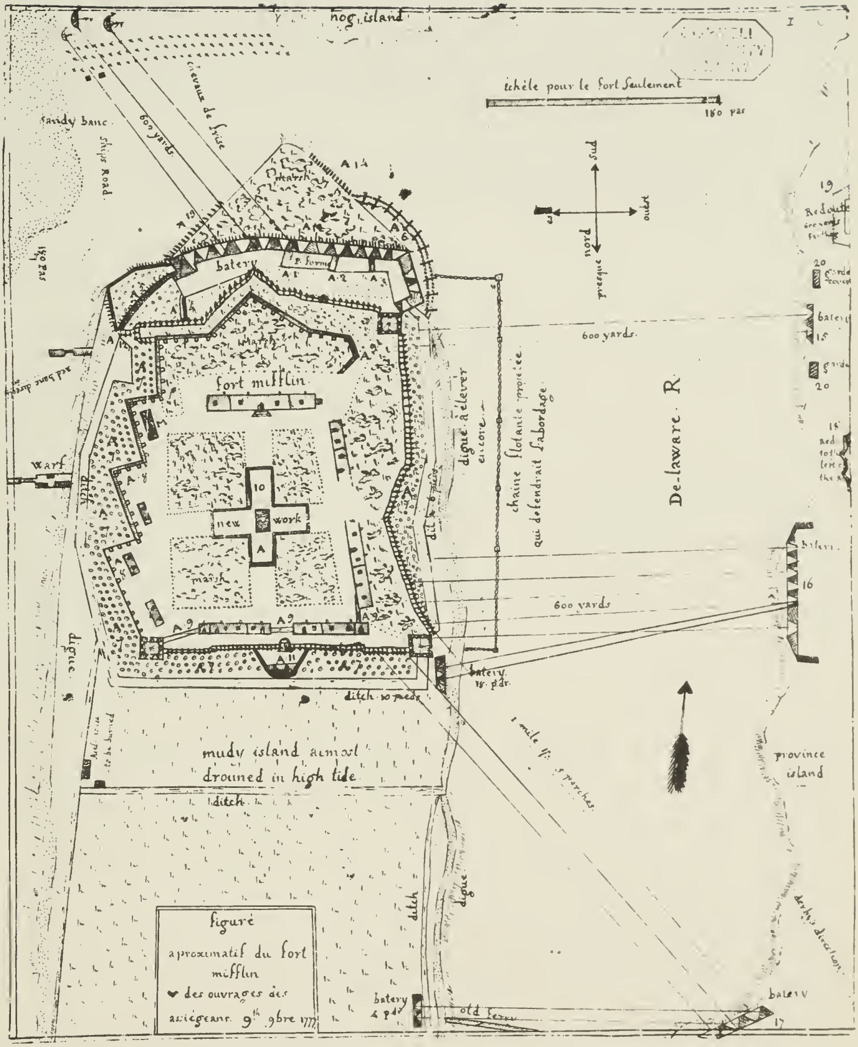
Our batteries were nothing more than old spars and timber laid up in parallel lines and filled between with mud and dirt. The British batteries in the course of the day would nearly level our works, and we were, like the beaver, obliged to repair our dams in the night. During the whole night, at intervals of a quarter or half an hour, the enemy would let off all their pieces, and although we had sentinels to watch them and at every flash of their guns to cry, "a shot," upon hearing which everyone endeavored to take care of himself, yet they would ever and anon, in spite of all our precautions, cut up some of us.

The engineer in the fort [Fleury] . . . . was a very austere man and kept us constantly employed day and night; there was no chance of escaping from his vigilance.

Between the stone wall and the palisadoes was a kind of yard or pen, at the southern end of which was a narrow entrance not more than eight or

FORT MIFFLIN, 9 NOVEMBER 1777. *Fleury, chief engineer at the fort, drew this plan on the eve of the enemy's full-scale attack. He denoted improvements made since his arrival with the letter* A. *Fleury included enemy batteries on the western shore of the Delaware, the chevaux-de-frise,* upper left, *and a projected floating chain,* center. *On the reverse side Fleury scribbled: "The engineer author of this imperfect draught begg indulgence for it; considering that he has not paper, pen, rule, neither Circel, and being disturbed by good many shells, or cannon's balls, flying in the fort." The plan's key, in Fleury's own words, is as follows:* A1,2,3—*Traverses to defend the Battery from Ricochet Shot;* A4,5—*Ditches to close the Left of the Battery which was open;* A6—*A double Iron Chain which incloses the right of the battery;* A7—*Pits with sharp upright Stakes, to defend the approaches to our Inclosure;* A8—*Banquet raised round the Wall;* A9—*Ditches and Parapet of Reunion between our Barracks, which will make a second Inclosure, and be furnished with loop-holes;* A10—*Last Retreat in the middle of the Fort made when we had only 120 Men in the Garrison;* All—*Demilune to flank the front, substituted to the Blockhouse which was blown up;* A12,13,14—*Fraise-work.*

Sparks Collection, Cornell University Libraries


figuré
aproximatif du fort
mifflin
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asiégeans. 9th 9bre 1777
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10
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warf
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digue
ditch 30 pieds
digue à élever
encore
chaine flotante proposée
qui défendrait l'abordage
600 yards
De-laware R.
batery
16
batery
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1 mile 1/5 5 perches
19
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17
mudy island almost
drouned in high tide
ditch
ditch
digue
batery
4 p.dr
old ferry

ten feet wide, with a ditch about four feet wide in the middle, extending the whole length of the pen. Here, on the eastern side of the wall, was the only place in the fort that anyone could be in any degree of safety. Into this place we used to gather the splinters broken off the palisadoes by the enemy's shot and make a little fire, just enough to keep from suffering. We would watch an opportunity to escape from the vigilance of Colonel Fleury, and run into this place for a minute or two's respite from fatigue and cold. When the engineer found that the workmen began to grow scarce, he would come to the entrance and call us out. He had always his cane in his hand, and woe betided him he could get a stroke at. At his approach I always jumped over the ditch and ran down on the other side, so that he could not reach me, but he often noticed me and as often threatened me, but threatening was all, he could never get a stroke at me, and I cared but little for his threats.

It was utterly impossible to lie down to get any rest or sleep on account of the mud, if the enemy's shot would have suffered us to do so. Sometimes some of the men, when overcome with fatigue and want of sleep, would slip away into the barracks to catch a nap of sleep, but it seldom happened that they all came out again alive. I was in this place a fortnight and can say in sincerity that I never lay down to sleep a minute in all that time.

The British knew the situation of the place as well as we did. And as their point-blank shot would not reach us behind the wall, they would throw elevated grapeshot from their mortar, and when the sentries had cried "a shot," and the soldiers, seeing no shot arrive, had become careless, the grapeshot would come down like a shower of hail about our ears.

—Martin, *Private Yankee Doodle*, pp. 86–89.

Fleury's own account of the siege of Fort Mifflin demonstrates the cumulative damage of the enemy's artillery, the mounting crisis of supply, and the continuing shortage of men. One day flying brick fragments wounded Fleury; another time a timber knocked him unconscious and killed a companion. Although the garrison was extremely fatigued and at times nearly one-half incapacitated, Fleury insisted that the fort could hold out if only he could get more manpower and supplies. That never happened. On November 15 Fort Mifflin's garrison withdrew across the river to Fort Mercer.

As reflected in the excerpts below, Fleury encountered some difficulty working with the headstrong Colonel Smith. After reading Fleury's journal entry for November 3, Washington recognized the problem and quickly sought to remedy it. Washington's advice to Smith contained a rare commentary on the scope of an engineer officer's authority vis-à-vis that of the commanding officer:

> . . . His [Fleury's] authority at the same time that it is subordinate to yours must be sufficient for putting into practice what his knowledge of Fortification points out as necessary for defending the post, and his Department, tho inferior, being of a distinct and separate nature requires that his orders should be in a great degree discretionary, and that he should be suffered to exercise his judgment.[16]

Washington went on to describe Fleury as "a Young Man of Talents" who "has made this branch of Military Science [engineering] his particular study," and concluded, "I place a confidence in him."

8. "OUR RUINS WILL SERVE US AS BREAST WORKS, WE WILL DEFEND THE GROUND INCH BY INCH"

From François Fleury's journal.

3 [*November 1777*]. For two days past we had suspected that the Enemys Vessels made different turns in the course of the night to the Augusta's wreck[17]—either to carry off the Cannon which the Galleys had neglected throwing into the water, or taking possession of, or to tow off the Hulk—but they had a more important object which they have been permitted to execute without interruption—and this morning's daylight discover'd to us their two nights' labour—they are raising a battery of heavy Cannon upon the hulk which is aground on the sand bank, the Galleys do not disturb them in their work, which if they finish it, will do great injury to our Fort—where you know there is no Shelter for the Troops—it is important to drive them from that particular spot of the River, and thirteen Galleys with two floating Batteries may do it if they please.

As we are in want here of Joist, Pickets, Palisades, and even Earth, and as it is impossible to fortify a place with water unless one has means to stop it—I went yesterday with 20 men to endeavour to get wood on the Jersey Shore, but I could get only a few Pickets, of which I shall make palisades, if I am permitted to use them according to my Ideas.

When His Excellency approved my Zeal and my remaining at Fort Mifflin in quality of Engineer, he did not give me an order to act in that capacity, and I can only advise without being heard. While Baron Arendt was present he understands the Military Art, and my Opinions in point of fortification were his—but he is absent,[18] and you know there are persons who know a great deal without having ever learnt—and whose obstinancy is equal to their Insufficiency. However I do not complain of any one, I confine myself only to observing that my Zeal for your Cause cannot be useful unless I am permitted to display it, in a branch which I have studied, on a spot with which I am well acquainted, by my own Remarks, and those of many other Engineers skilful and accurate men.

Honour commands me to do everything in my power. I hope to do my Duty in whatever way I am made use of—and to die in the breach if necessary—but I will observe only that I thought myself employ'd in a different capacity from that of a Grenadier.

3d. night. A considerable number of the Enemys boats pass'd and repass'd in the course of the night, near the Shore of Province Island—it appears that this Communication between their Fleet and Philadelphia is established, and what will surprise you perhaps, is that it is a sure one, there being no Interruption on our part—we cannot cannonade them from the Fort, the shade of Trees prevents our being informed of their passage otherwise than by the noise of oars, and firing at sounds would be wasting pretious Ammunition. . . .

Novem. 5th, 6th. . . . The Enemy seem determined to Winter in Province Island if they can't take Fort Mifflin. . . . If His Excellency would form some Enterprise on their Rear, I believe we might make a useful diversion—as I know the Island I offer to serve as Guide to any party that shall be order'd there, in concert with Col. Smith I intend this night to reconnoitre in an arm'd boat the position of their Sentinels, and the safest Landing places, of which I shall make a Report. . . .

8th. The Enemy have enlarged the upper Battery opposite the Fort, we this morning discover 5 Embrasures, masked as yet with Fascines—it is probable they will all open at once—their project seems to be, to knock down our palisades, and storm our west front between the two block houses. To cover our palisades on this side we have apply'd to General Varnum[19] to furnish us with fascines which we shall place on the Summit of the bank to serve instead of Earth, which is not to be had—I don't know whether we shall be able to procure the Fascines.

10. It is probable that the Enemy will undertake to carry this place by storm, and I should not fear them if we could fix the floating Chain . . . it would cover the Front which is likely to be attacked, and by delivering us from our uneasiness for this side, would enable us to post the men destined for its defence, at the Wall of Masonry which is ten feet high and is not out of the reach of an Escalade, notwithstanding the Ditches, Pits and Stakes, etc., with which we have endeavour'd to surround it.

The Commodore, Master of the *incomparable* Chain in question, proposes to stretch it by means of Buoys, between our Island and Province Island. I believe this obstacle to the communication between the Enemy's Fleet and Army will be of little consequence, and if he would spare us the Chain, the Enemy would pay dear for their Hardiness if they dared attack us. Colonel Smith wrote this morning to ask this favour, but I am afraid that public Interest will suffer by private misunderstandings. I am interrupted by the Bombs and Balls which fall thick. . . .

Novem. 11th. The Enemy keep up a heavy fire . . . Our block houses tho' facd with fascines, Joist and well rammed Earth, have not been able to hold out—they are laid open and all their Cannon dismounted except two—I have endeavour'd to cover them in order to flank us in case of Assault—but they are not secure and I have no more Joist, Fascines or Palisades—I have written to Red bank for Supplies in these Articles, but am rather neglected. . . .

13th. The Enemy have open'd a Battery on old-Ferry-wharf—the Walk of our Rounds is destroyed—the Block-houses ruined—Some men Kill'd and wounded each day.

I forgot to inform you that a Ball struck against some Bricks the fragments of which slightly wounded Col. Smith, Capt. George and myself—those two Gentlemen cross'd immediately to Red-bank—I have heard that Col. Smith is recover'd but don't know when he'll return.

Our Garrison is exhausted with Fatigue and ill-health, is extremely discouraged and I fear would make but an indifferent Defence in case of Storm. At the last Alarm, one half were incapable of Duty.[20]

Nov. 13th at night. The Enemy have kept up a firing part of the night—their shells greatly disturb our workmen, and as the moon rises opposite to us, her light discovers to the Enemy where we are. As long as my Workmen would remain with me, I employed them in covering the two western Blockhouses with Joist within and without and filling the interstices with rammed Earth. I have closed the breaches made in our Palisades, with Planks, Centry-boxes, Rafters, and strengthen'd the whole with earth—General Varnum has sent me neither Ax, Fascine, Gabion nor Palisade, altho he promised me all these Articles, I suppose it has not been in his power—it is impossible however with watry mud alone to make works capable of resisting the Enemys 32 Pounders.

14th. . . . Fort Mifflin is certainly capable of defence if the means be furnished—if they supply us from Red-bank with Tools, Fascines, Palisades, etc., all which they may do in abundance—the Fire of the Enemy will never take the Fort, it may kill us men but this is the Fortune of War. And all their bullets will never render them masters of the Island, if we have courage enough to remain on it . . . Fort Mifflin is the important Object, it must be maintained and furnish'd with means of defence. Men, Earth and Fascines to cover them—Our new Garrison consists of 450 Men—what can they do in a circumference of works so extensive as ours—being weak everywhere, they could make a defence nowhere and the Fort would be carried—The apparent Project of the Enemy is to debark on the Island; either to risque a Storm, or to establish a battery on the old ferry wharf, or nearer if they can—what means have we of hindering them—with a Garrison so feeble, can I make any advantageous Sallies—can I dislodge the Enemy—if I raise a battery against their will it not serve against ourselves in case of attack—for without a sufficient number to defend it, it must be given up—our grand Battery has 19 Embrasures and 8 cannon, two of which are dismounted—we must have Artificers to make Wheels—Fascines and Palisades for breaches. General Varnum supplies us scantily—We must have men to defend the Ruins of the Fort—our Ruins will serve us as breast works, we will defend the Ground inch by inch, and the Enemy shall pay dearly for every step—but we want commanding Officer, ours is absent and forms projects for our defence at a distance. . . .

14th at 7 oClock. The Enemy keep up a great Fire from their Floating Battery and the shore. . . .

Our blockhouses are in a pitiful condition, but with fascines I hope to cover two pieces in each lower story which will be sufficient to flank us. I say again the Enemys fire will not take our fort. If they attempt a storm we shall still have a little parapet to oppose to them, but we must have men to defend it.

Novem. 14th at noon. We have silenced the Enemy's floating Battery, I know not whether we have dismounted her Cannon, or whether her present Station exposes her too much, but the firing from her has ceased. I suspect that she is destined to land men on this Island.

Their grand battery is in little better condition than our blockhouses—We have open'd an embrasure at the Corner of the Battery, and two pieces here joined to two others on the left which we have reinstated, throw the Enemy into disorder. . . .

Tonight an Attempt is to be made on the floating battery of the Enemy.

Novem. 15. [*This last entry was evidently not written by Fleury.*] At day break the Enemys batteries began a vigorous fire upon the Fort, and the Fleet set Sail to come up with the Tide. One of their Vessels . . . and two Sloops . . . advanced between Hog Island and the Northern point of Tinicum near 1000 yards from the grand Battery.

The Six other Vessels and the Galley carrying a 36 pounder approached the Chevaux de frise at the distance of 600 yards from the Fort. We fired upon them with red hot bullets.

At 8 OClock their Fire began *responded* [to?] by that of the Land batteries, and a quarter of an hour after many successive broad sides ruined our parapet, and dismounted one of our Guns, there being only two Embrasures in that side. The Musquetry . . . hindered the canoniers from remaining on the Platform; and the land batteries making a cross-fire with the Vessels render'd the right of the battery untenable. However Capt. Lee who commanded the Artillery, and Major Fleury who commanded the Infantry appointed for firing . . . did not abandon this part of the right of the battery. All their men were either kill'd or wounded and the Cannon broken to pieces. . . .

At 11 OClock, Ammunition began to fail, and Major Thayer order'd the blue Flag to be hoisted as a Signal of distress to the Fleet—Major Fleury the Commissary and some Volunteers ran to the Magasine and after searching found a 32 pounder Cartridge and Several 18 pounder Cartridges and the Fire was renewed.

In conformity to Major Thayers order they were lowering the Flag in order to hoist the Signal of Distress, but Capt. Lee and Major Fleury ran to hinder it, entreating Major Thayer rather to send off boats from the wharfs than make a Signal which would discover our weakness to the Enemy—The Major approved and the Flag was hoisted again—The Enemy had slacken'd their Fire a moment doubtless thinking that we were prepared to surrender but our Cannon undeceived them. It was one OClock. Our Ammunition was exhausted—and we had only two Guns fit for use. The rest were dismonated, some even shattered to pieces—our parapet was destroyed—one of the Sloops station'd towards the middle of the Fort, demolished [a?] Bank and level'd our Palisades—a Body of troops appeared on the opposite Shore ready to embark—our Garrison was [*illegible*].

The Major call'd a Council of War at 2 OClock, composed of Major Talbot, Major Fleury, Capt. Lee, Captain Dickinson, and another Captain—The Result was —*Supplies of Amunition or Boats*.

The Enemy's Fire continued furiously and ours [languidly ?] from two Pieces of Cannon—the Wall was half demolished—The Blockhouses flew about in splinters—a Piece of Timber torn from the Block house on the right, struck down Capt. Lee and Major Fleury who were standing near a Gun, the former was kill'd and the latter remain'd Senseless.

Major Talbot who ran to their Assistance was wounded with two Grape Shot in the thigh and Arm.

The Fire continued till Night, and Ferry boats arriving instead of a Reinforcement—The Ammunition, Provisions and Arms were carried off. The Cannon spiked. The carriages broke. The Barracks set on fire—and at half after eleven the Garrison evacuated the Fort, and at the same time the Oars of the Enemys boats were heard—bringing on Troops to attack our ruined Palisades.

—Ford, "Defences of Philadelphia," ***Pennsylvania Magazine*** **18:472–73, 478; 19:72–73, 80–82, 244–46; Washington Papers, rolls 44 and 45.**

As usual, Joseph Martin recounted with dramatic flair the details of the final day's siege. No fewer than ten British vessels trained their guns on the fort and met with but feeble response from the American batteries. "When the firing had in some measure subsided and I could look about me," he recalled, "I found . . . the fort was as completely ploughed as a field."

9. "IF EVER DESTRUCTION WAS COMPLETE, IT WAS HERE"

From the narrative of Joseph Plumb Martin.

We continued here, suffering cold, hunger and other miseries, till the fourteenth day of November [1777]. On that day, at the dawn, we discovered six ships of the line, all sixty-fours, a frigate of thirty-six guns, and a galley in a line just below the *chevaux-de-frise*; a twenty-four-gun ship (being an old ship cut down,) her guns said to be all brass twenty-four-pounders, and a sloop of six guns in company with her, both within pistol shot of the fort, on the western side. We immediately opened our batteries upon them, but they appeared to take very little notice of us. We heated some shot, but by mistake twenty-four-pound shot were heated instead of eighteen, which was the caliber of the guns in that part of the fort. The enemy soon began their firing upon us and there was music indeed. The soldiers were all ordered to take their posts at the palisadoes, which they were ordered to defend to the last extremity, as it was expected the British would land under the fire of their cannon and attempt to storm the fort. The cannonade was severe, as well it might be, six sixty-four-gun ships, a thirty-six-gun frigate, a twenty-four-gun ship, a galley and a sloop of six guns, together with six batteries of six guns each and a bomb battery of three mortars, all playing at once upon our poor little fort, if fort it might be called.

Some of our officers endeavored to ascertain how many guns were fired in a minute by the enemy, but it was impossible, the fire was incessant. . . . The enemy's shot cut us up. I saw five artillerists belonging to one gun cut down by a single shot, and I saw men who were stooping to be protected by the works, but not stooping low enough, split like fish to be broiled.

About the middle of the day some of our galleys and floating batteries, with a frigate, fell down and engaged the British with their long guns, which in some measure took off the enemy's fire from the fort. The cannonade continued without interruption on the side of the British throughout the day. Nearly every gun in the fort was silenced by midday. Our men were cut up like cornstalks. . . .

The cannonade continued, directed mostly at the fort, till the dusk of the evening. As soon as it was dark we began to make preparations for evacuating the fort and endeavoring to escape to the Jersey shore. When the firing had in some measure subsided and I could look about me, I found the fort exhibited a picture of desolation. The whole area of the fort was as completely ploughed as a field. The buildings of every kind [were] hanging in broken fragments, and the guns all dismounted, and how many of the garrison sent to the world of spirits, I knew not. If ever destruction was complete, it was here.

—Martin, *Private Yankee Doodle,* pp. 90–92.

The next morning, November 16, British sailors landed on Fort Island, raised their flag, and immediately began a battery to cover the removal of the chevaux-de-frise, the final phase of their reduction of the Delaware defenses. Four days later the rebels evacuated Fort Mercer. Nearly two months after the British first entered Philadelphia, and at a tremendous cost to them in men and ammunition, they controlled the river.

While Fleury directed the defense of Fort Mifflin, Duportail was at Washington's side. At the end of October he reconnoitered near Whitemarsh, Pennsylvania, fourteen miles outside Philadelphia, and pronounced the area very satisfactory for an encampment. Once Washington decided to move his headquarters to the new location he assigned Duportail, as Chief Engineer, to fortify the position. Much to Howe's distress, this base still placed Washington within striking distance of Philadelphia.

Atop a hill near Whitemarsh, Duportail constructed a fort consisting of breastworks lined and faced with logs. Redoubts held down the corners. The engineer designed the position for 300 men and surrounded it with abatis. Hills in three directions completed the defenses. The camp was so strong that in December Howe abandoned plans for an attack.

From Whitemarsh on November 12 Duportail provided French War Minister St. Germain with the following masterful analysis of Howe's position and the American potential for success. The patriots, Duportail wrote, benefited greatly from British mistakes, particularly the Burgoyne campaign; from Howe's sluggishness and timidity; and from the enemy's failure to supply the twenty thousand men needed to win the war.

Duportail's view of the Americans was skewed; he found them "soft, without energy, without vigor, without passion" for their cause. He observed that they were accustomed to "an abundance of everything necessary for a comfortable and agreeable life." They were idle, loathed war, and disliked being "reduced to lead a hard and an irregular life." Worth noting is Duportail's certainty that a treaty of alliance between France and the United States "would be the best way to ruin everything." His own experiences had attested to an American hatred and fear of the French that far exceeded American hatred of the English.

10. "THERE IS A HUNDRED TIMES MORE ENTHUSIASM FOR THIS REVOLUTION IN A SINGLE CAFE IN PARIS THAN IN ALL THE UNITED COLONIES"

Louis Duportail to St. Germain.

12 November 1777

Monsigneur:

. . . Now it is quite natural, after the experience of this campaign, to ask oneself: "Will the Americans succeed in gaining their freedom, or not?" In France, without doubt, one can hardly judge only by that which has happened. They will decide in the affirmative, but as for us, who have witnessed everything it is another affair. It is necessary to speak plainly. It is not the good conduct of the Americans which won for them a campaign which on the whole has been so happy; it is rather the mistakes of the English. It was an enormous error for the British government to order General Burgoyne to traverse more than 200 leagues of a country bristling with obstacles, almost desert, and consequently of no use to take, and that merely in order to join Generals Howe and Clinton in the center of the country. This project might seem very magnificent in the bureaus of London, but for those who know the country, it was very defective. This opinion of mine does not come after the event; you remember perhaps, Monseigneur, that I was greatly pleased with the English for opposing us here with only 10,000 men; that I greatly hoped that General Burgoyne would only arrive here when the campaign would be possible no longer; that his army would be cut in half by hunger, misery, desertion, daily losses on the journey, and our militia, scattered in the woods on his route, and fighting thus in the fashion which is peculiar to them. The result was more successful than I had hoped.

If the English, instead of making so many diversions, which were all to the detriment of the principal action, had opposed General Washington with about 20,000 men, I do not know exactly what would have become of us. Because, for us, in doubling our army we do not double its strength by a great deal, rather do we triple our difficulty. So much for the plan of this campaign.

If we consider next the conduct of General Howe, we shall see that he has not done that which he could have done, as I had the honor of informing you after the battle of Brandywine. If the English had followed up their advantage, there would no longer be any question of the army of Washington; and since then, General Howe has conducted all his operations with a slugginess, a timidity, which astonishes me every day. But it is necessary to bethink oneself—they can send another general, and then we shall not find ourselves so well off.

However, events which depend on the ability of generals (a thing impossible to anticipate) must not be considered in our speculations for the future. Having regard only to the number of troops, I believe that if the English could have 30,000 effectives here, they would reduce the country. A second thing that could hasten this reduction, and even bring it about almost alone, is the lack of munitions of war. They are in want of nearly everything here. Another thing, they must have cloth, sheets, leather, rope, salt, brandy, and sugar, etc. These last articles are more important than one would at first suppose.

Before the war, the Americans, although ignorant of luxury, had an abundance of everything necessary for a comfortable and agreeable life. Not having much to do they passed a great deal of the day in smoking and drinking spiritous liquors or tea; that is the fashion of the people here. It is, therefore, much against its will that this people finds itself transformed suddenly into a warlike people and reduced to lead a hard and an irregular life. Moreover, they generally detest war. Also it is easy to see that if their privations increase to a certain point, they will prefer the yoke of England to a liberty which costs them the comforts of life.

This language astonishes you, Monseigneur—such is, however, this people. It is soft, without energy, without vigor, without passion for a cause that it sustains only because it is natural for it to follow for a long time a movement which one has given it. There is a hundred times more enthusiasm for this revolution in a single cafe in Paris than in all the united colonies.

It is necessary, therefore, that France, if she wishes to assist this revolution, furnish the people with everything that they need and not experience too great privations—it will cost France several millions, but it will be amply repaid by the destruction of the maritime power of England, which having no more colonies, will soon have no marine. Her commerce in consequence will pass to France, which will no longer have a rival among the European powers. . . .

One might ask, that in order to terminate the American Revolution sooner, would it not be better for France to make a treaty with the United States, and by mutual consent with them send 12 or 15,000 men? This would be the best way to ruin everything. This people here, although at war with England, hate the French more than they do the English, (we prove it every day), and in spite of all that France has done and will do for them, they would prefer to become reconciled with their former brothers, than to have among them crowds of men that they fear more. For if they would consent in a moment, the natural antipathy soon breaking out would hatch the most fatal quarrels. . . .

P.S. Congress has just raised me to the rank of Brig. Gen.

—Watts, "A Newly Discovered Letter," pp. 103–06.

Duportail's promotion to brigadier general on 17 November 1777 gave him new importance not just within the engineer department but also within the whole Army. He became an active participant in councils of war; his role as staff advisor to the Commander in Chief on engineering matters was now a major part of his duties as Chief Engineer. At Whitemarsh on November 24 Duportail attended his first council of war. Washington sought his generals' advice on "the expediency of an attack on Philadelphia," and the Chief Engineer joined the majority in recommending against such an attack.

Duportail's opinion on Philadelphia derived from his fear that failure might spell destruction for the main Army. "Does it become it [the Army] to stake the fate of America upon a single Action?" he asked. Duportail outlined the necessary dispositions for an attack and concluded that success required great harmony, "presence of mind in the Superior officers," and "firmness in the troops." He apparently doubted that all three requirements could be achieved simultaneously. Moreover, an attack was extremely risky without more information on the enemy's defenses.

11. "TO JUSTIFY SUCH AN ENTERPRISE THE SUCCESS MUST BE ALMOST CERTAIN"

Louis Duportail's first opinion as chief engineer in council of war.

November 25, 1777

To attack the Enemy in their Lines appears to me a difficult and dangerous Project; it has especially this very considerable Inconvenience, the exposing our Army, in case it does not succeed, to a total Defeat. This is easily demonstrated, one of the principal means proposed, is to throw two thousand men in the rear of the Enemy; if we do not succeed, these are so many men absolutely lost; as to the main body of the Army which is to attack in front, it must pass through the intervals left between the Abattis and Redoubts, which they say, form very narrow passages. If after penetrating, we should be repulsed, can Troops in disorder return easily by the passages through which they were introduced? Will it not be very easy for the English to cut off their Retreat? Our whole Army may then be destroyed or made prisoners. Now does it become this Army, which is the principal one, to run such Risques? *Does it become it to stake the fate of America upon a single Action?* I think not, for my part I never would place this Army in a situation where its Rear was not perfectly free, much less where it will be inclosed on all sides without means of retreat, to justify such an enterprise the success must be almost certain. To judge of this, we have only to take a view of the dispositions which must be made for this attack. This view will render the difficulties evident. Ist: two thousand Men are to be introduced by a River, of which the Enemy are wholly Masters. If we embark them near the Enemy, the noise may alarm them; if at a distance, the cold which they will undergo will render the use of their Arms exceedingly difficult in the morning. Besides, can we flatter ourselves that the River side is unguarded; let us reflect that a single man is sufficient to make this project miscarry and cause us the loss of two thousand men.

As to the attack in front, these are nearly the dispositions which would be followed. We should march upon as many Columns as there are Roads leading to the Enemy; upon our arrival in their presence, each commanding officer of a Column, according to the size of the Works before him and the number of Men which he judges are contained in them, divides his Troops in two parts, one of which surrounds his Works and attacks them vigorously, while the other marches boldly through the intervals and falls upon the Troops in the rear; but every one sees how much harmony is required in all these dispositions, how much presence of mind in the Superior officers, how much firmness in the troops who have to execute all their manoeuvers under the fire of an Enemy who are in a great measure covered.

If the enemy Works are not inclosed, the enterprise would be much less dangerous; if they are, the Enterprise is too hardy.

His Excellency, I think, desired us to say a word respecting the operations in Jersey; in general it seems to me, that we can do nothing better than to endeavour to attack the Enemys force there with superior numbers; but there is a very important observation to be made, which is, that we should not weaken ourselves too much here, for we are to consider that the Enemy may recross their Troops in one night and attack us by daybreak with their whole force. . . . If however an attack be determined upon, the Enemy's works should be more particularly reconnoitred.[21]

—Washington Papers, roll 25.

Together Washington and Duportail inspected the enemy's works. Duportail found them so strong that were he in command of such works with five thousand men "he would bid defiance to any force that should be brought against him."[22] That clinched the argument: there would be no attack on Philadelphia.

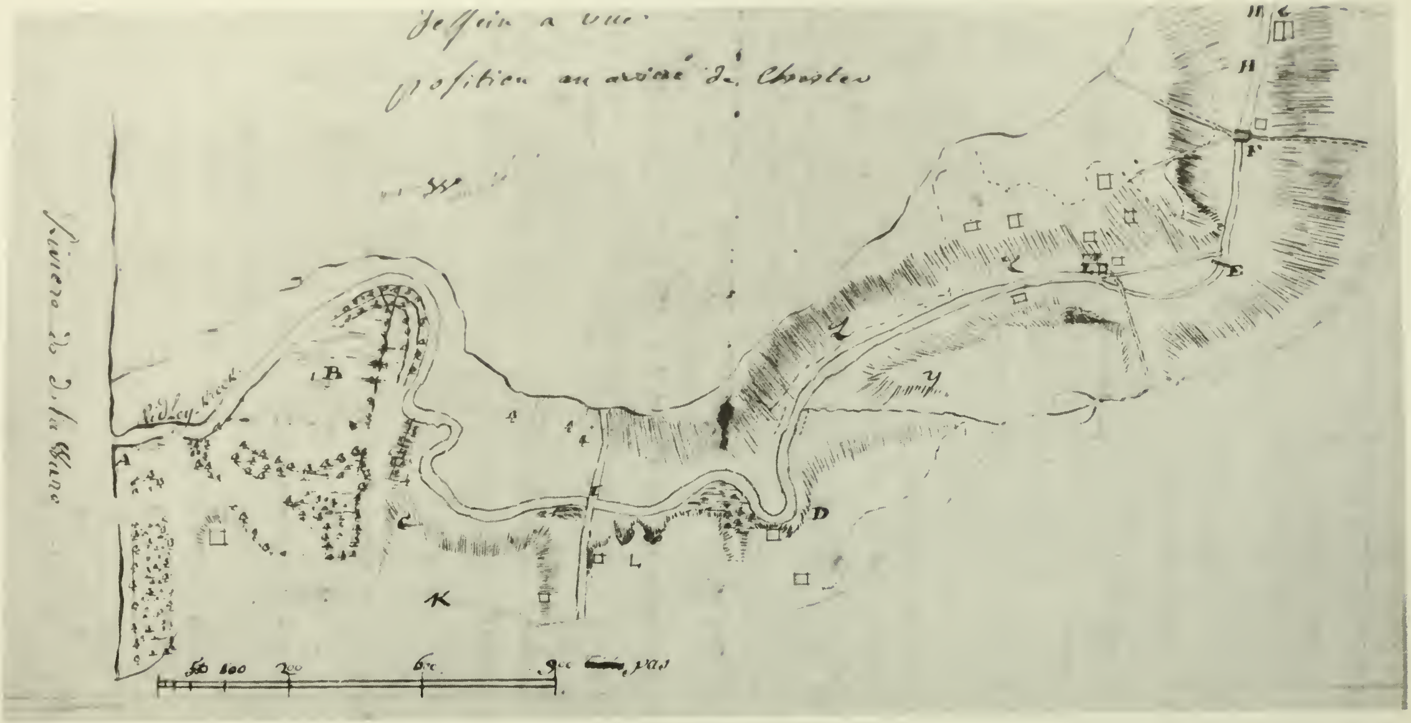
Next Washington turned his thoughts to a suitable location for winter quarters and asked the council of war for recommendations. Duportail favored Wilmington, while other officers suggested the Pennsylvania towns of Chester, Darby, Lancaster, and Reading. The one drawback Duportail found in Wilmington was that the position was so advantageous the enemy would feel compelled to attack. The Chief Engineer saw the upcoming winter as a time to recondition the army for a fresh start, and "we ought not to have its Repose preceeded by a Defeat," he counseled. Of particular importance in choosing between Lancaster and Wilmington, Duportail wisely pointed out, was the availability of supplies, for "it is much better to lose Soldiers in Combats . . . than to lose them by Disorders, and Desertion arising from their Misery."

12. "WILMINGTON ANSWERS THE END OF MAKING THE SUBSISTANCE VERY DIFFICULT TO GENERAL HOWE"

Louis Duportail to George Washington.

December 1, 1777

By taking Winter Quarters from Lancaster to Reading we abandon to the Enemy Jersey and all the Country adjacent to Darby, Chester and Wilmington, one of the richest Tracts in this part of the Continent—By



CHESTER, PENNSYLVANIA. *Chief Engineer Duportail made this sketch, probably in autumn 1777, to accompany a reconnaissance report on the area for General Washington.*
Washington Papers, Library of Congress

establishing them at Wilmington we cover the Country, and do not so completely abandon that part of it which is before Philadelphia, nor even Jersey because our proximity to the Enemy and the ease with which we could throw ourselves upon the Rear of their Lines in case the Schuylkill should be frozen, will keep them in respect, and put it out of their power to send considerable Detachments on the other side of the Delaware from the fear of weakening themselves too much—and the small detachments which they may send will be greatly restrained by the Jersey Militia—The Position then of Wilmington answers the end of making the subsistance very difficult to Genl. Howe, who has not only his Army to feed but likewise the Inhabitants of the Town, and who must besides furnish Provisions for the Army of Genl. Burgoyne if he means that they should embark for England—This position further deprives him of the means of recruiting in the Country, extending himself in it, adding to the number of his Partisans, in a word, gaining the Country—It has besides the advantage of rendering his Communication with his fleet difficult, for I imagine the Vessels will not be able to approach Philadelphia when the Ice prevails—I should not omit mentioning a case in which this Inconvenience would be very considerable. If War should be declared between France and England, and Genl. How from a dread of finding himself blocked up in the Spring by a French Fleet should wish to quit Philadelphia, we shall be within distance at Wilmington for hindering his Embarkation of which we should have timely notice.

This Position then unites great Military Advantages—but it must be confessed at the same time that these very advantages ought perhaps to prevent our taking it—because the Enemy probably will not suffer us there, and will march out against us—Thus to ask whether the Position of Wilmington is eligible, is to ask at the same time whether it is eligible to expose ourselves to an Action, and perhaps more than one.

If the Season were less advanced, I don't see why we should avoid them—but at present, what end would be answer'd—if we should gain an advantage we should be unable to pursue it—if we experience a Check we run the risque of seeing our Army dissipated in the rude marches consequent on a defeat—Consistently with the plan which we ought to form of putting our Army in good condition this winter and preparing it for a good Campaign, we ought not to have its Repose preceeded by a Defeat.

As to the other points to be consider'd in this Question, whether Wilmington or Lancaster will be the most proper Situation for furnishing the Army with every necessary—I cannot decide being ignorant of the Country, but it appears to me in general that this point deserves our most serious attention—it is much better to lose Soldiers in Combats with the Enemy to whom we cause a loss at the same time—than to lose them by Disorders, and Desertion arising from their Misery. Misery destroys part of an Army and leaves the other without Vigour, without Courage, and without good Will—we should find ourselves then in the Spring with a Body of an Army incapable of any thing, and consequently have no right to expect a successful campaign.[23]

—Washington Papers, roll 25.

Meanwhile, having considerable militia at his disposal, Washington in early December reconsidered an attack on Philadelphia. He found Duportail still strongly opposed, unless the Schuylkill River were frozen and would permit a rear assault in combination with a frontal attack. The key for Duportail, who appreciated the significance of the Germantown defeat, was not the number of troops but their quality. With an engineer's keen insights he observed that Washington needed "troops that are not astonished at suffering a considerable loss in the first onset, without causing any to the Enemy, for this must be the case in an attack of Intrenchments."

13. "THE BATTLE OF GERMAN TOWN OUGHT TO BE A LESSON TO US"

Louis Duportail to George Washington.

Decr. 3d, 1777

Sir

I have examined anew with all the attention of which I am capable, the project of attacking the English, and it still appears to me too dangerous; the great body of Militia with which we might be reinforced for this purpose, does not give me any additional hope of succeeding. It is not the number of Troops which is of importance in this case, but it is the quality, or rather, their nature and manner of fighting. The Troops wanted are such as are capable of attacking with the greatest vivacity, the greatest firmness. Troops that are not astonished at suffering a considerable loss in the first onset, without causing any to the Enemy, for this must be the case in an attack of Intrenchments, although when the Works are carried the chance turns and the loss is on the side of the intrenched. Now, are the Militia or even the Continentals capable of undergoing this Trial, in which the best Troops in the World cannot always support themselves. I am very sorry, in giving the motives for my opinion, to be obliged to speak so unfavorably of our Army; but the Battle of German Town ought to be a Lesson to us: if our Army had proceeded with vigour on that occasion, would not the English have been completely defeated. The dispositon was excellent. Your Excellency in that instance really conquered General Howe, but his Troops conquered yours, if then notwithstanding the advantage of a complete surprise, notwithstanding the advantages of ground, we were repulsed. What would happen before a Line of Redoubts well disposed in all appearance, and the intervals of which are closed with Abbatis.

There is, however, a case in which I think we might attack the Enemy with Success. I mean if the Schuylkill should be sufficiently frozen below their left to admit of our throwing our greatest force on their Rear, at the same time that we should make an attack in front. Gentlemen acquainted with the Country must decide this point, if indeed the Schuylkill is sufficiently frozen every year to afford a passage for Columns of Troops with Artillery. My opinion is fixed, I think the Army ought to be marched to the other side of Schuylkill to be reinforced with all the Militia that can be collected, while we wait for the favourable moment.

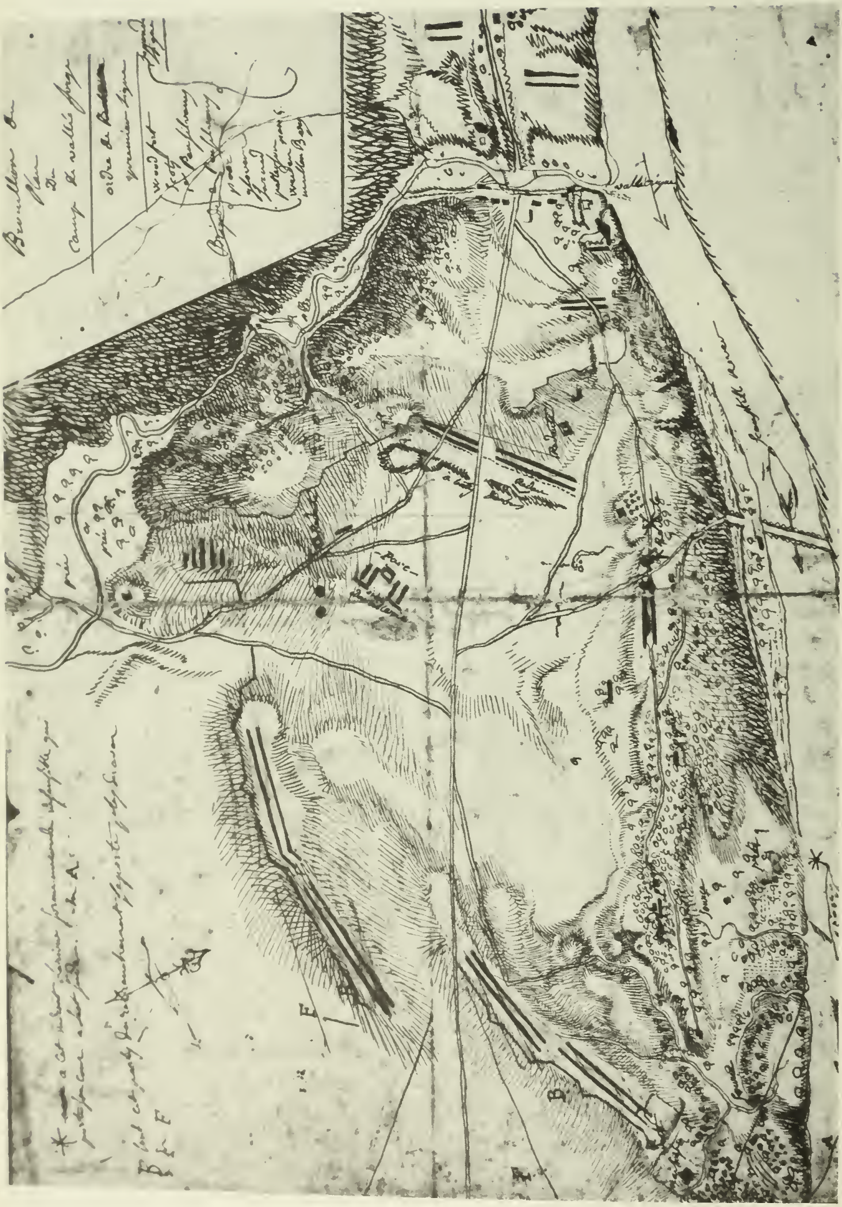
I would go more minutely into the subject, if your Excellency did not order me to send my Answer this Morning. I did not receive your Excellency's letter until half after twelve and it is now half after one.[24]

—Washington Papers, roll 45.

Washington finally rejected both the Lancaster-Reading corridor and Wilmington as winter quarters because the former involved dividing the army among several posts while the latter placed the army outside Pennsylvania, an outrageous prospect to Pennsylvania and New Jersey authorities. Following the advice of Brig. Gen. Anthony Wayne, Washington compromised on Valley Forge. On December 19 Washington's men—weary, in rags, and starving—reached their new encampment.

Some generals were horrified at the choice. Maj. Gen. Johann "Baron de" Kalb, for example, called Valley Forge a desert that "can only have been put into the head of a commanding general by an interested speculator or a disaffected man."[25] But the site was easily defended. Moreover, it lay twenty miles from Philadelphia and even nearer Congress's temporary seat at York. Again, Washington entrusted Duportail with the critical task of fortifying the site. As an enemy attack seemed certain come spring, Duportail had to complete the works quickly despite frozen ground, a shortage of men and tools, and "the general misery of the troops from which the workers had to be chosen."[26]

By late March the Chief Engineer assured the president of Congress that the encampment was "tenable against the enemy's utmost efforts by their present powers."[27] The defenses included a line of entrenchments fronted with abatis on the eastern side, nearest Philadelphia; fortifications on Mount Joy along the western flank; and a star redoubt on a bluff overlooking a bridge built on the Schuylkill by Maj. Gen. John Sullivan's men. The works on Mount Joy consisted of an infantry redoubt (Fort Washington), several redans, and entrenchments that extended to the eastern face of the mount as well as along its northern face to the heights above the Schuylkill.[28] Washington seems to have preferred an enclosed work on the


Brouillon du plan du camp de vallée forge
ordre de Bataille
premiere ligne
vallée forge
Schuylkill river
pré
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summit of Mount Joy; but, citing the lack of space to build a new work and insufficient troops to man it, Duportail recommended against the idea.[29]

To be sure, Valley Forge was not impregnable, but Howe never attacked it. To the British, an assault on the American camp, which only remotely threatened Philadelphia, might prove too costly. Howe later recalled: "Having good information in the spring that the enemy had strengthened the camp by additional works, and being certain of moving him from thence when the campaign should open, I dropped all thoughts of an attack."[30]

While the army dug in at Valley Forge, two plans were advanced to destroy British shipping in the Delaware. In December David Bushnell set afloat above Philadelphia kegs of powder designed to explode on contact. Unfortunately Bushnell released his floating mines too far from the British vessels for the ebb tide to carry them to their intended targets. Instead most of the kegs caught in the ice or drifted far afield. Eventually one boat did blow up, with many casualties resulting; other kegs discharged harmlessly in the water. Alarmed, the British left nothing to chance. They positioned themselves along the city's waterfront and fired at everything seen floating in the river. Thus ensued the celebrated "Battle of the Kegs." The affair inspired writer Francis Hopkinson, chairman of the Continental Navy Board and a friend of Bushnell, to immortalize the "battle" in humorous verse.

14. "BATTLE OF THE KEGS"

A poem by Francis Hopkinson, 1778.

Gallants, attend, and hear a friend
    Trill forth harmonious ditty.
Strange things I'll tell, which late befell
    In Philadelphia city.

'Twas early day, as poets say,
    Just when the sun was rising.
A soldier stood on a log of wood
    And saw a thing surprising.

As in amaze he stood to gaze—
    The truth can't be denied, sir—
He spied a score of kegs or more
    Come floating down the tide, sir.

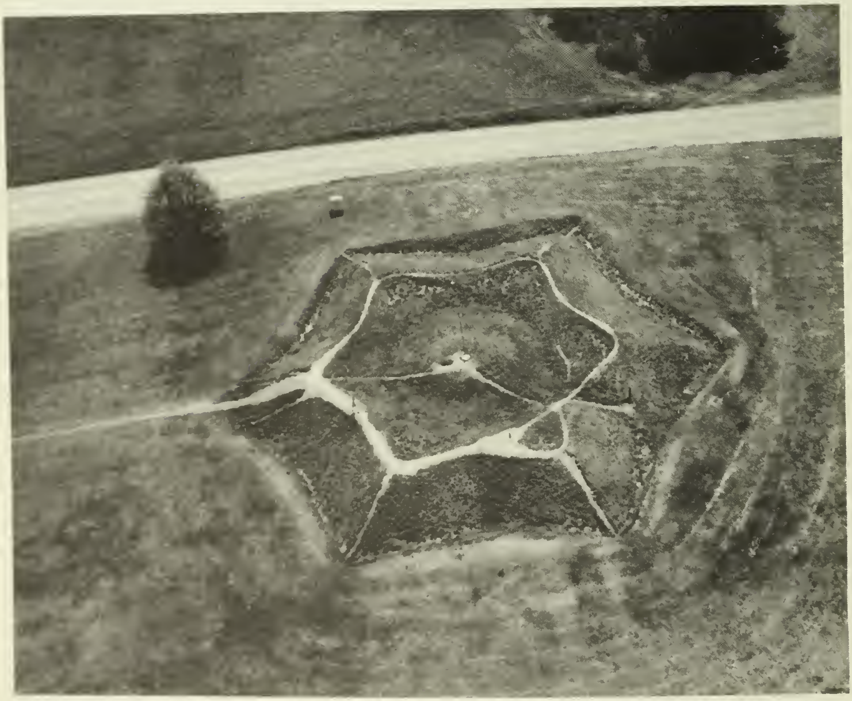
THE CAMP AT VALLEY FORGE. *This sketch in Duportail's hand shows the entrenchments he planned.*
Historical Society of Pennsylvania

A sailor, too, in jerkin blue,
    This strange appearance viewing,
First damned his eyes, in great surprise,
    Then said, "Some mischief's brewing.

"These kegs, I'm told, the rebels hold,
    Packed up like pickled herring,
And they're come down t'attack the town
    In this new way of ferrying."

The soldier flew, the sailor too
    And scared almost to death, sir,
Wore out their shoes to spread the news,
    And ran till out of breath, sir. . . .

Sir William, he, snug as a flea,
    Lay all this time a-snoring;
Nor dreamed of harm, as he lay warm
    In bed with Mrs. [Loring].



VALLEY FORGE STAR REDOUBT. *This aerial photograph shows the remains of the star redoubt designed by Duportail as part of the Valley Forge defenses.*

Courtesy Valley Forge National Historical Park

Now in a fright, he starts upright,
Awaked by such a clatter;
He rubs his eyes and boldly cries,
"For God's sake, what's the matter?"

At his bedside, he then espied
Sir Erskine at command, sir;
Upon one foot he had one boot,
And t'other in his hand, sir.

"Arise! arise!" Sir Erskine cries.
"The rebels—more's the pity—
Without a boat are all afloat
And ranged before the city.

"The motley crew, in vessels new,
With Satan for their guide, sir,
Packed up in bags, or wooden kegs,
Come driving down the tide, sir.

"Therefore prepare for bloody war;
These kegs must all be routed,
Or surely we despised shall be,
And British courage doubted."

The royal band now ready stand,
All ranged in dread array, sir,
With stomach stout, to see it out
And make a bloody day, sir.

The cannons roar from shore to shore,
The small arms make a rattle;
Since wars began, I'm sure no man
Ere saw so strange a battle. . . .

The kegs, 'tis said, though strongly made
Of rebel staves and hoops, sir,
Could not oppose their powerful foes,
The conquering British troops, sir.

From morn till night, these men of might
Displayed amazing courage;
And when the sun was fairly down,
Retired to sup their porridge.

An hundred men, with each a pen,
Or more, upon my word, sir,
It is most true would be too few
Their valor to record, sir.

Such feats did they perform that day
Against those wicked kegs, sir,
That years to come, if they get home,
They'll make their boasts and brags, sir.

—**Moore, *Songs and Ballads,***
pp. 209–16.

Still serving as an Army engineer but working independent of Bushnell, François Fleury spent January 1778 below Trenton observing the enemy and planning a way to set fire to British ships on the Delaware. He first proposed to approach the ships by crossing the river on the ice, but he found the river was not frozen solid. Next he hit upon the idea, detailed below, of using batteries and unmanned fire boats to accomplish his purpose.[31]

15. FLEURY DESCRIBES HIS PLAN FOR FIRE BOATS

18 January 1778

. . . Two kinds of fire Boats may be employed. The first, would be Loaden, with tuns powder; and burst in the midle of the fleet . . . they could be surely directed, by one strong Racket filled with particular Composition; and fasten'd in the very midle of the head of the boat, to give him direction and velocity . . . One mast sunk in the stern of the boat horisontaly under the water and to which one sail would be cicularly bound, would hinder the Current to drive it out the way.—The head of the boat armed with a strong sharp point of iron would Remain fixed . . . till its bursting up. N. B. . . . the expences will be small. Every flat bottom boat answer the purpose. . . .

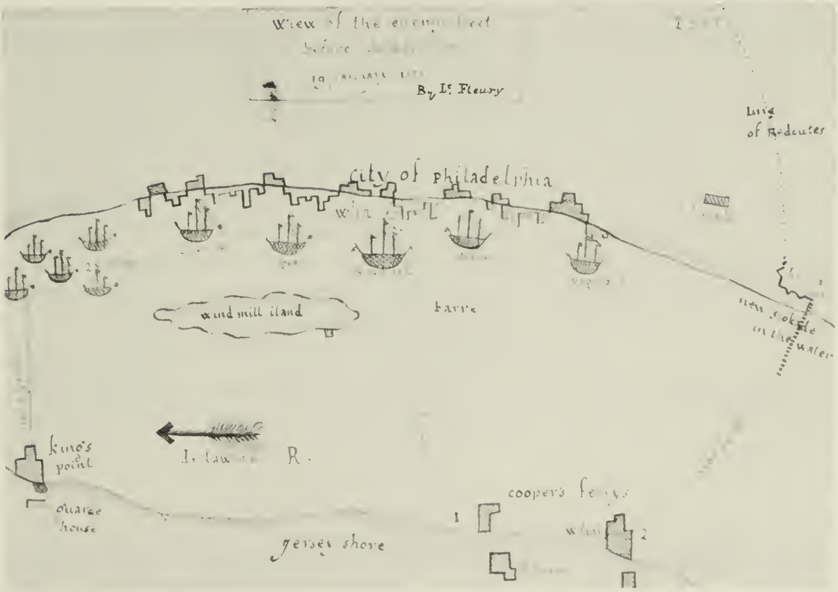
The Commodore haselwood offers to help me by his knowledge in their Construction, and Rectify my idea. . . . He promises to come at trenton, where we Could try, by one boat, before executing by several.

The galleys have salpeter, and powder; i can make the Composition; and one turner will do. . . .i suppose that the park of artillery h[as] some quick maches already done.

2d. Kind of fire boat. That second kind is not to be used so soon. The nord est wind blows very often and very hard in the month of february and march, and according to the instruction that i have Received of the ferry men several boats filled with tarr [and] other [Combustibles ?] could be leaded in the night, over the barr below Coopers ferry, and philadelphia,—and after the wind and tide would surely drive them . . . to the wharf of the city where the ships lay.

If his excellency aproves the above schemes, i begg to send me positive orders. . . . The commodore will be glad to Receive the same and we will work friendly and cordyally together; nor day nor night will be from our part to justify the truth of his excellency.

—Washington Papers, roll 46.



THE ENEMY FLEET AT PHILADELPHIA. *Fleury drew this sketch to accompany his report to Washington on fireboats in January 1778.*
Sparks Collection, Cornell University Libraries

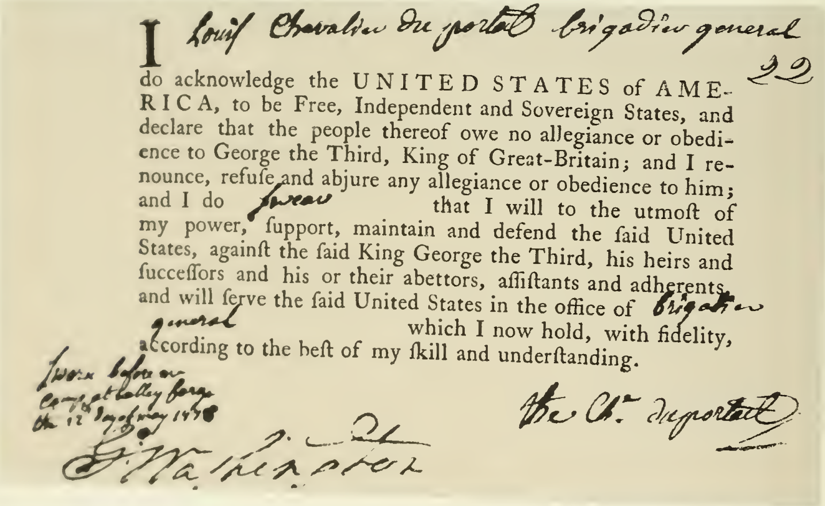
Though skeptical, Washington on January 20 gave Fleury permission for a test. The Frenchman's technique compared interestingly with Bushnell's submarine, which sought to use an underwater device for the same end. As no references to Fleury's fire boat scheme after the test permission have been found, it is uncertain why the plan was never adopted.

By April 1778 the Continentals longed for action, but Washington proceeded cautiously. He saw three courses of action open to him: recover Philadelphia, launch a campaign against New York, or remain secure at Valley Forge until the enemy made a move. He asked his officers for advice. Most preferred action; but Duportail, supported by Generals Baron von Steuben and the Marquis de Lafayette, advised restraint. They thought the enemy position in Philadelphia was simply too strong.

Duportail's response contains a great deal more than mere answers to Washington's questions. The Chief Engineer's remarks on the strength and condition of the Continental Army (its troops were too new to be called regulars) are almost as significant as his ardent support for waging a defensive war of posts. It was dangerous, Duportail contended, to consider the Americans equal to the British militarily or to insist on waging war as European armies did. He warned against assuming that because the patriots had successfully attacked enemy lines at Saratoga they could do it again in Philadelphia. The circumstances were just not the same. In the tactics of Fabius, the Roman general, Duportail saw an appropriate model: avoid general battle, keep on the defensive, and occupy strong positions.

According to Duportail, to most effectively draw out the British, even the Valley Forge encampment was too close to Philadelphia. But the Americans had a clear advantage so long as the enemy had to leave the city to fight. Interestingly, the Frenchman not only advanced the idea that retreat is not dishonorable but also stressed the importance of making considered plans for retreat should it be necessary. He further pointed out the need, even in a defensive war, for small but frequent "enterprises" against the enemy.

In the supplement to his report Duportail asserted that a military victory for the English would likely be the result of internal weakness in the American Army, and he lamented the wretched conditions that had led to large numbers of desertions.



I Louis Chevalier du portail brigadier general 22
do acknowledge the UNITED STATES of AMERICA, to be Free, Independent and Sovereign States, and declare that the people thereof owe no allegiance or obedience to George the Third, King of Great-Britain; and I renounce, refuſe and abjure any allegiance or obedience to him; and I do swear that I will to the utmoſt of my power, ſupport, maintain and defend the ſaid United States, againſt the ſaid King George the Third, his heirs and ſucceſſors and his or their abettors, aſſiſtants and adherents, and will ſerve the ſaid United States in the office of brigadier general which I now hold, with fidelity, according to the beſt of my ſkill and underſtanding.

Sworn before me
Camp at Valley forge
the 12 day of may 1778
G. Washington

the Chr duportail

OATH OF ALLEGIANCE. *By order of Congress on 3 February 1778, all officers were to sign an oath of allegiance to the American cause. Duportail signed this oath at Valley Forge in May 1778, shortly after announcement of the French alliance.*
Library of Congress

16. "IT IS . . . A PRINCIPLE OF WAR CAUTIOUSLY TO AVOID DOING WHAT YOUR ENEMY WOULD HAVE YOU DO"

Louis Duportail's opinion on attacking the British at Philadelphia.

April 1778

. . . I do not see that we have established the principles which ought to guide us in war, or, to speak more frankly, it appears to me that we have adopted defective principles. Almost every one considers the American Army in the same light as the British, thinks it capable of the same things, and would have it act in the same way; thus we see from time to time bold projects formed, rash resolutions proposed, which are the better received as they flatter those to whom they are proposed, by shewing them that the Nation is judged capable of vigorous actions—but this flattery may have fatal consequences, it may ruin America. Let it be our endeavor in this important business, to consider things in their true light.

It is an Axiom among Military men, that Troops which are not what are called *Regular Troops* cannot make head against regular troops in level ground or in any Situation that does not offer them very considerable advantages. The American Army therefore cannot stand against the British who are composed with British or German troops all Regular. . . . The American Army [being] new in every respect, and not having had a foundation of formed officers and Soldiers, cannot as yet claim the Title of regular Troops, and that it is therefore incapable, as I remarked above, of resisting the Enemy on equal ground. Besides has not experience manifestly proved it? We were beaten at Brandywine—we were beaten at German Town altho' we had the immense advantage of a complete Surprise. . . . Let us therefore avoid committing ourselves in this way again—for it is farther a principle of war cautiously to avoid doing what your Enemy would have you do—Now let General Howe be asked whether he would like to meet the American Army on nearly equal ground for the issue of the present dispute, he will answer that it is the wish of his heart—that he desires only two or three such opportunities to decide the cause of America—because he is sure of beating us, and that the loss of general actions will soon have ruined our party without recourse. I know very well that many persons are not of this opinion, and that they say, that having more men than the English and greater facility of procuring them we cannot fight the Enemy too often because even if we should be beaten, the loss of the Enemy, though less in itself would be greater relatively to their whole number, and consequently they must soon be ruined—but this opinion is built upon a foundation altogether false. Our numbers are not superior to those of the English. . . . What we ought to propose to ourselves, is to defend the country inch by inch, to endeavor to hinder the enemy from rendering himself master of it, consequently never to receive him but when we are protected by a natural or artificial fortification, in other words to carry on what is styled a *defensive War.* This is our true part and it is so obvious that in Europe, all Military men and even those who are not so, suppose this to be our Conduct—if the Americans could consult the modern daily publications, they should there find that the model offered to General Washington is principally Fabius, that wise Roman who ruined Hannibal by refusing to fight him in plain. Fabius however commanded Romans, but these Romans had been thrice defeated, they were disheartened, dreaded the Enemy, and were nearly reduced to the condition of new and unformed Troops. The Consul conducted himself accordingly, avoided general Battles, kept himself on the defensive, always occupying strong positions and where the Enemy could not attack him but with considerable disadvantage . . . .

[*First Question:*] Ought we to open the Campaign by an attack on the Enemy's lines as I hear sometimes proposed?

If the English army were out of its lines at the distance of one or two miles in front, from the reasons just mentioned we ought not to attack them for we should expose ourselves to almost certain Defeat (I suppose our army so large as in its last Campaign): and because this army is covered by lines, because it has added to its natural Strength that of Fortification we would attack it? This is manifestly unreasonable. Fortification is the means used by the weak to enable them to resist the strong. We Engineers count that a good fortified place enable those who defend it to resist ten times their own number.—Field Engineering does not afford such considerable advantages, but according as the ground is more or less judiciously chosen, as the Engineer has traced his work with more or less skill, and afterwards as the Profiles are more or less respectable, executed with more or less care, this kind of fortification renders one equal to two, three, four, and sometimes more . . . it is a principle in fortification to establish as perfect an equality as possible in the different parts, so that no one be more attackable than another; now by what I have seen of the English Lines, I judge that the defenders may at least hold them against double their numbers. . . .

I know very well that those who propose to attack the English in their lines, deduce their arguments from the American Troops having attacked and carried lines in the North, but let us take care that successes in the North do not occasion defeats here, where the circumstances are by no means the same. The Northern Troops may perhaps have attacked and carried some portion of Intrenchments, either illy made or injudiciously disposed, or not sufficiently lined with troops;—or perhaps they attacked with vastly superior numbers—but that they ever attacked with a number nearly equal to that of the enemy (which would be our case), Intrenchments such as those of the English at Philadelphia, supported on each flank by a River, secure from being turned and attackable only in front, is what I will never believe. I will add to this by way of explaining my idea, that if I were General Howe, and the Americans should advance to attack me in my lines, I would not give myself the trouble of defending them. I would retire some four or five hundred yards in the rear to some covered place, I would only leave a few poppers to deceive them and make them think they had forced the lines, and when they had once got within and were preparing to push their imaginary advantage, I would fall upon them like a thunderbolt. . . .

Second Question: Ought we at the opening of the campaign to approach Philadelphia? No. We ought not. We are even too near already, and for this reason—would we approach the enemy in order to be more certain of fighting him? This is altogether useless—he will certainly come to seek us. The English Minister does not send Genl. Howe with his army into America, to remain inactive in Philadelphia. He must fight us—must endeavor to destroy us. He must conquer the Country; *not to do it, is to be conquered* himself. It is to give gain of cause to the Americans. Therefore General Howe will make it his business to find us. . . .

We ought . . . to keep ourselves between 30 and 40 miles distance from Philadelphia, and since we have the advantage at present of obliging the enemy to march to our own ground to fight us, it is our part always to post ourselves in such a manner as that he cannot attack us but under considerable disadvantages; and for this purpose to always choose Situations strong in themselves, and besides avail ourselves of the Succors of Art. We should farther prefer positions in which we might avoid a general Battle if we thought proper—we should esteem it an essential quality in our positions to have the Rear free and an easy Retreat in order that an unlucky action might not be attended with too extensive consequences. If we should discover in our position any capital Defect which did not at first appear, or which only became such in consequence of the movements of the Enemy, we would immediately decamp and go elsewhere.—We should be cautious not to give into the Snare, which our Enemies will not fail to lay for us, endeavoring by their Raillery on our Retreats, to make us establish it as a point of honor, rather to keep a bad position than to make a retrograde movement. We should not forget that in war, to advance or retire are neither honorable or dishonorable; that it is at the end of a Campaign that the Prize is given, and that Glory is his reward who has gained his end—besides if the Enemy in the movements which he should make to try us, to turn us, should give us an opening, should expose any of his Troops, Posts, Baggage, to be attacked with advantage; we should never fail to do it—for one must not imagine that defensive war consists in never forming any Enterprise against the Enemy, but in such war the whole army (I Confess) should not form enterprises against the whole enemy's army—enterprises are formed with Detachments, whenever you can assure yourself of attacking with greater numbers—these expeditions even ought to be sought for, and frequently repeated, for it is thus that new Troops are by degrees enured to War.—Care must be taken, only, not to expose them to too severe marches, excessive bad weather or the want of Provisions. It appears to me that this kind of War would greatly embarrass the Enemy: for at length, as it is absolutely necessary that he attack us, he would do it; but as we are supposed to be always well fortified, and choose positions in which the whole Army cannot be attacked at once—as we support the points only as long as it can be done with advantage, and retire whenever the Enemy begins to get too great an ascendancy over us, he is always liable to suffer considerable Loss without procuring decisive Success—in fact if we retire, even if the greatest part of the Army should have been successfully employed in supporting the point attacked, it is after all no battle—it is a post forced—a particular Corps repulsed—and this has no consequence—the Retreat is peaceably conducted—another post is taken hard by, and the business is to begin again—but General Howe has not a sufficiency of Troops, to purchase ground so dearly—it is easy to see that by these means 20 miles of Country would cost him half his Army . . . he would be forced to yield the Country to us, and retire to shut himself up in his lines—and this is all that we have to desire, because it would prove to the English their inability to reduce this State, and consequently America—for what would happen in this State would in like manner happen in any other by pursuing the same Conduct. . . . If we pique ourselves upon making war as equal European Armies do, if we will engage in general Actions, attack the Enemy or receive him in any kind of ground and unprepared, we shall experience some considerable Check—the Enemy will . . . pursue us vigorously, hinder our reassembling, dissipate us, drive us from the Pennsylvania State, then availing himself of the disaffection of the majority of the inhabitants, make it declare for the King, and perhaps take arms in his favor—an event of the greatest consequence relatively to the other States of America, which would not be unshaken by such an example—relatively to the English who would be encouraged by it to make the greatest Efforts. And lastly considered with reference to foreign powers who not being near enough to estimate such Events according to their real value—and distinguishing in them only a proof of the great Superiority of the English, or inconstancy of the Americans, would not perhaps involve themselves further by giving them unavailing Succors.

Supplement. The more i reflect upon the matter above treated, the more it seems to me impossible that the English can reduce America by arms, at least so long as the Americans behave hymself properly. Provided also that the Court of france will not Change her political system and by the awe of War which she gives to England, will hinder its sending to America more troops than it has sent hytherto. If there is any cause of reducing it, we should look for that Cause in the American army itself. I have observed just now that in three or four months our army diminished one half without doubt principally by desertion. That is very frightful for everybody sees that if it continues so all America will soon be exhausted of men. There can be certainly many Causes of that prodigious desertion, but the most Considerable and which can be Remedied is the bad situation of the Soldiers, the want of cloathing that (besides he must bear all the intemperatures of the weather) abases his profession in his own eyes and makes him disdain it—the want of provisions During many Days the more hard to be borne as when he has any he has too much—the want of Cleanliness in his tents which causes us shameful sicknesses that are the appendices of the extreme misery. . . .

[*Duportail later added:*]

It appears to me that there is a previous important point to be decided because all our operations ought to be subordinate to it—this point is to know, in case of our army suffering a check and not being able to maintain its ground here, in what direction our Retreat is to be made in preference—towards the blue mountains?—On the other side of the Susquehannah?—On the other side of the Delaware?—By determining this, we shall determine where the grand magazines of the army are to be formed—and then we shall be governed by these two considerations in the choice of our positions as well as in all our movements. . . .

—Kite, *Duportail*, pp. 60–66, 68–72.

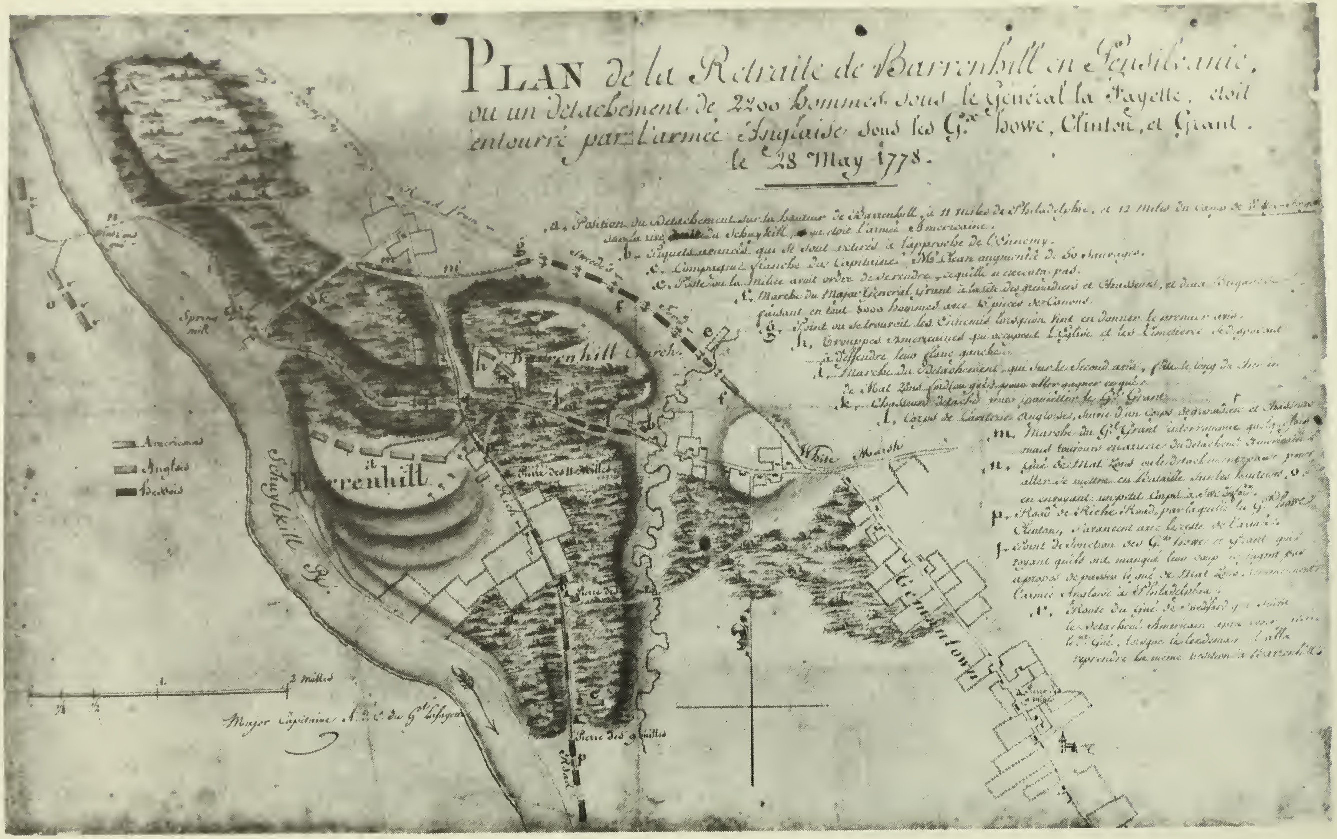
Circumstances changed rapidly. In early May 1778 France recognized American independence and openly allied with the United States. By June the British appeared ready to make a move. Incredible as it was to the rebels, the enemy appeared to be contemplating retreat from Philadelphia. Washington's officers favored remaining on the defensive. Duportail recommended staying at Valley Forge until the enemy acted. To do otherwise might jeopardize the patriots' immense advantage. If the British left Philadelphia, he said, the Americans should pursue them, striving as always "to avoid General actions—to seek advantageous posts."

17. "HERE IS A CERTAIN AND IMMENSE ADVANTAGE"

Louis Duportail to George Washington.

June 18, 1778

I think we ought not to quit our position of Valley Forge—before the enemy has evacuated Philadelphia—he must have lost his reason, to remain in that city without being in a condition to defend it. Thus, either the


PLAN de la Retraite de Barrenhill en Pensilvanie,
ou un detachement de 2200 hommes sous le general la Fayette, etoit
entourré par l'armée Angloise sous les Gx Howe, Clinton, et Grant.
le 28 May 1778.
a. Position du Detachement sur la hauteur de Barrenhill, à 11 miles de Philadelphie, et 12 Miles du camp de Valley-forge
sur la rive du Schuylkill, ou étoit l'armée Americaine.
b. Piquets avancés qui se sont retirés à l'approche de l'Ennemy.
c. Compagnie franche du Capitaine Mc Clean augmentée de 50 sauvages.
e. Poste ou la Milice avoit ordre de se rendre, ce qu'elle n'executa pas.
f. Marche du Major General Grant à la tête des grenadiers et Chasseurs, et deux Brigades
faisant en tout 8000 hommes avec 15 pieces de Canons.
g. Point ou se trouvoit les Ennemis lorsqu'on vint en donner le premier avis.
h. Trouppes Americaines qui occupent l'Eglise et les Cimetieres se disposant
à deffendre leur flanc gauche.
i. Marche du Detachement qui sur le second avis, file le long du chemin
de Mat Son ford (au gué) pour aller gagner ce gué.
k. Chasseurs detachés pour inquietter le Gl Grant.
l. Corps de Cavalerie Angloise, suivie d'un Corps de grenadiers et Chasseurs
m. Marche du Gl Grant intercommunee quelquefois
mais toujours en arriere du detachement Americain
n. Gué de Mat Son ou le detachement passe pour
aller se mettre en bataille sur les hauteurs o.
en envoyant un petit corps à sa defense.
p. Road de Riche Road par laquelle les Gx Howe et
Clinton s'avancent avec le reste de l'armée.
q. Point de Jonction des Gx Howe et Grant qui
voyant qu'ils ont manqué leur coup
à propos de passer le gué de Mat Son, ramenent
l'armée Angloise à Philadelphia.
r. Route du Gué de Swedford qui suivit
le Detachement Americain
le gué, lorsque le lendemain il alla
reprendre la même position à Barrenhill.
Barrenhill
Barrenhill Church
Schuylkill R.
White Marsh
Germantown
Road from
Swedes ford
Spring mill
Riche Road
Road
Pierre des 11 milles
Pierre des 9 milles
Americains
Anglois
Hessois
2 milles
1
½
¼
Major Capitaine A.D.C. du Gl. Lafayette

intelligence which says there are no more than 2 or 3000 men there, is false—or the English have it in their power by the measures which they have taken, signals agreed upon, number of boats to recross in sufficient force, in case of our advancing to attack them.

The matter besides is reducible to this—Either the English are not really going away—or they are—if the former be the case all that has hitherto been done is a feint on their part, and conceals some snare into which they would draw us.

If they are really determined to go away—what can we desire more—here is a certain and immense advantage—let us not risk the loss of it, by procuring another, which even should we obtain it, would not change our affairs.

However, as we have here 12,000 men and that our position may be defended by a smaller number, I think it would be well to send 1500 men into the Jerseys, to reinforce what is there already—the whole should be commanded by a person well acquainted with the Country—they ought not in general to oppose the enemy in front, on his march—but to follow him on his left flank.

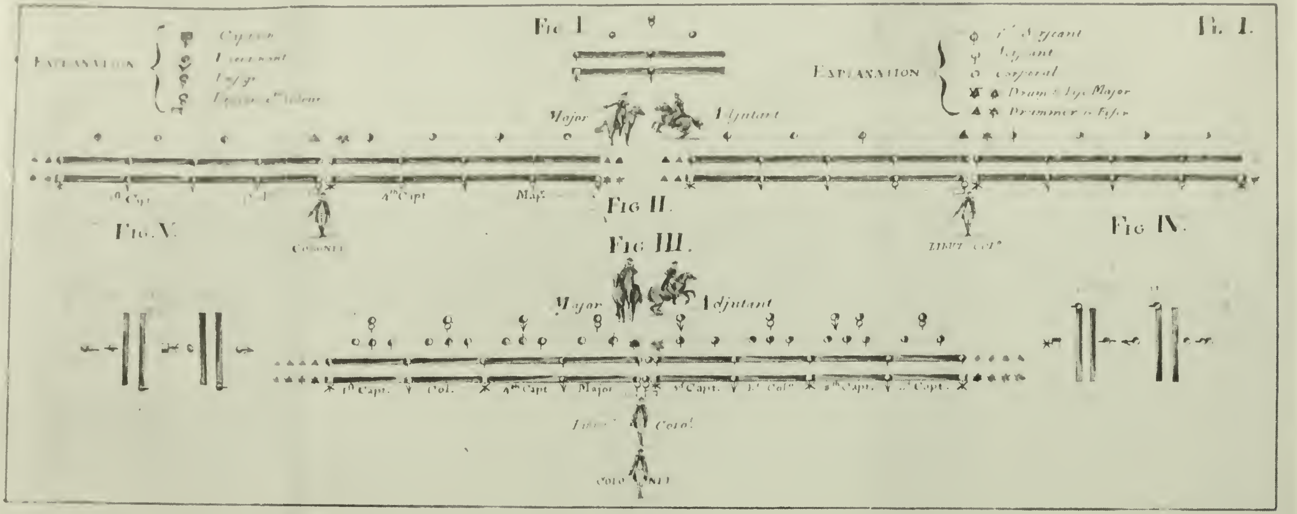
When the English shall have passed the Delaware, we ought in my opinion to move to the banks of that River—and prepare to pass it likewise—but certain precautions are necessary—if we learn that the english are advancing hastily towards N. York—we may likewise pass with celerity—but if they should halt, or appear to march slowly—in that case I think our troops ought not to pursue the Enemy, as fast as they could cross the River but post ourselves advantageously near the River, and wait till the whole army has passed in order to advance in force.

In Jerseys as well as everywhere else, I think we ought always to avoid General actions—to seek advantageous posts—to have the Roads of Retreat well reconnoitered, and to have secure communications with our magazines.

After all, I find it difficult to believe that the Enemy mean to cross the Jerseys and go to New York—unless there is deficiency of trans-

RETREAT AT BARREN HILL. *Anticipating the enemy's evacuation of Philadelphia, Washington in mid-May 1778 detached a large force under the Marquis de Lafayette which took up a position on the Schuylkill River at Barren Hill, halfway between Philadelphia and Valley Forge. Having gotten word of Lafayette's advance, the British encircled him. They planned to destroy his camp on the morning of the 20th, but Lafayette learned of the scheme and escaped. Michel Capitaine du Chesnoy (1746–1804), an engineer officer who served throughout the war as Lafayette's aide-de-camp, provided this map of the action at Barren Hill.*

Historical Society of Pennsylvania

Pl. I.
Explanation
Captain
Lieutenant
Ensign
Explanation
1st Sergeant
Sergeant
Corporal
Drum & Fife Major
Drummer & Fifer
Fig I
Major
Adjutant
1st Capt
Col.
4th Capt
Maj.
Fig II.
Fig. V.
Colonel
Lieut. Col.
Fig IV.
Fig III.
Major
Adjutant
1st Capt.
Col.
4th Capt
Major
5th Capt.
Lt. Col.
3rd Capt.
2nd Capt.
Lieut. Colol
Colonel

ports—but we have the same conduct to observe in case the enemy should march down the left Shore of the Delaware to embark below.[32]

—**Washington Papers, roll 50.**

On June 18 Sir Henry Clinton, Howe's replacement as British commander, led the evacuation of Philadelphia. Clinton's army made its way across New Jersey toward New York; Washington left Valley Forge, reoccupied Philadelphia, and pursued Clinton into New Jersey. At Monmouth Court House on the 28th the two sides met in what proved to be the last general engagement of the war in the north. The battle ended in a draw. Afterward Clinton once again made New York the British northern stronghold, and Washington went forward with plans for a cooperative effort with America's new ally, hoping to end the conflict for good.

Though the rebels again controlled Philadelphia, they still feared for the city's safety. Pennsylvania officials planned to sink new chevaux-de-frise and improve Fort Mifflin. Indeed, after the Battle of Monmouth Washington ordered Duportail back to Philadelphia to report on what defenses were required. Realizing that his army might not be able to prevent the enemy from retaking Philadelphia, Washington hoped Duportail could form a plan to assure American control of the river. As experience had shown, control of the city was meaningless without control of the river. Washington suggested that Duportail center his attention on Fort Mifflin.[32]

Because Congress did not give Duportail the support he needed in Philadelphia, little was accomplished until the following year. Congress still lacked enthusiasm and funds for the project and directed Duportail to the governor of Pennsylvania for the necessary backing. Duportail got assistance and in February 1779 made a preliminary survey, which he followed up with proposals for a final survey.

Duportail insisted that he would plan a defense only if he personally conducted the survey and soundings of the river. He argued that he could complete the job within a few days, "whereas Persons not acquainted with Engineering will take up several Weeks to make what will be but an imperfect Report of the Situation of the River."[33]

ARMY DRILL MANUAL. *During the winter of 1778 Baron von Steuben, Washington's inspector general, compiled a drill manual for the Continental Army. François Fleury, an engineer officer serving then as an assistant to Steuben, helped prepare the text. Steuben engaged Pierre L'Enfant (1754–1825), another engineer officer, to illustrate it. This watercolor shows the formation of a company and a regiment. All of L'Enfant's original art work for the book was included in the gift copy of the manual presented to Washington and now in the possession of the Boston Atheneum.*

Boston Atheneum

The Chief Engineer wanted the details of the survey kept secret between himself and his assistant, Col. Louis de Shaix La Radière. Although annoyed by Duportail's penchant for secrecy, the Pennsylvania council continued its support for the project. The council did claim, however, that many citizens objected to "opening the most important Secrets of our Defence to Persons who have no natural Interest in, or attachment to the Country," a direct reference to Duportail and his companions.[34]

With the help of Radière and Maj. Jean Louis Ambroise de Genton, the Chevalier de Villefranche, Duportail completed the survey by 14 May 1779. For their services Pennsylvania awarded Duportail $2,000, Radière $1,000, and Villefranche $600. In accordance with Duportail's recommendations, the state carried forward work on Forts Mifflin and Billingsport, while ignoring Fort Mercer. In a final gesture of good will toward Pennsylvania, Duportail left Radière behind for an additional two weeks to assist in laying out the principal lines of the fortifications.

In 1780 the Marquis de Chastellux, a major general in the Comte de Rochambeau's army, visited the Philadelphia fortifications and then described them in his journal. He was well impressed with the improvements to Fort Mifflin and observed that having learned by experience, "the Americans have provided in the future against the misfortunes which cost them so dear."

18. CHASTELLUX REVIEWS THE DELAWARE RIVER DEFENSES

From the journal of the Marquis de Chastellux.

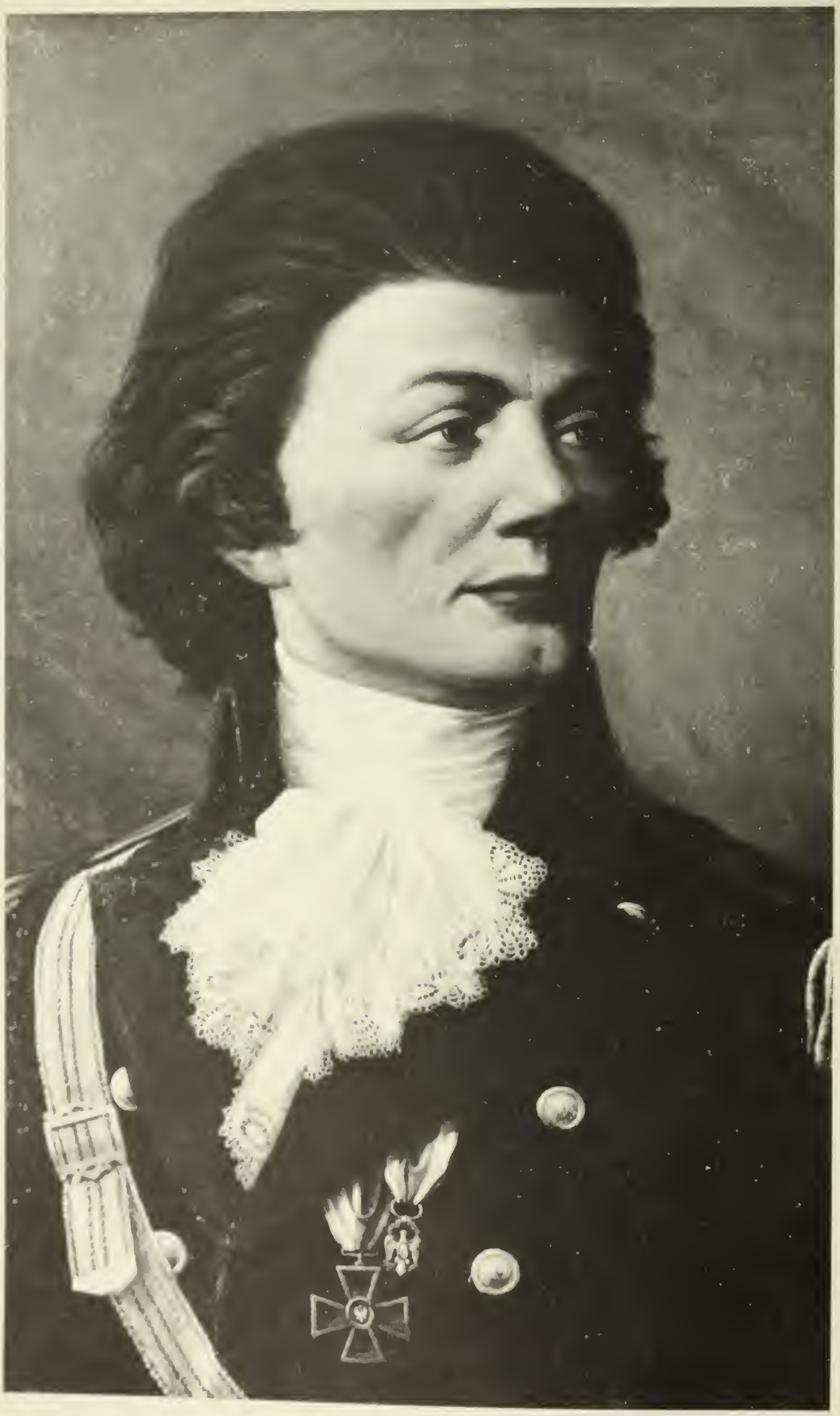
[Philadelphia] December 8, 1780

. . . As the present situation of affairs does not attract attention to this locality [Billingsport], the fortifications are somewhat neglected. The entire battery consisted only of one rather good brass mortar and five eighteen-pounders . . ., which Major [John] Armstrong, who commands on the river, and who had come to receive us, fired on my arrival. When America has more money and leisure she will do well not to neglect this post, as well as all those which can serve for the defense of the river. For once this war is terminated, she will see no more European armies on this continent, and all she can have to fear from England, in case of a rupture with her, will be limited to a few maritime expeditions, the sole object of which will be to destroy shipping, to ravage the country, and even to burn the towns within reach of the sea. Unfortunately Billingsport belongs to the state of Jersey, which can reap no advantage from it; and Pennsylvania, whose safety it would defend, has no other means to employ towards fortifying it than its own request and the recommendations of Congress, which are not always attended to. However this may be, Philadelphia has taken other precautions for her defense, which depend only on the state of Pennsylvania, and to this advantage is united that of an excellent position, which will soon be made into an impregnable fort. I am referring to Fort Mifflin, where we went on leaving Billingsport, still ascending the river. . . .

Taught by sad experience, the Americans have provided in the future against the misfortunes which cost them so dear [in 1777]. I saw with pleasure that they were extending the fortifications of Mifflin's Island, so as to enclose the fort on every side, which will also be surrounded on all sides by the Delaware for a ditch; and as the garrison will have a safe shelter in bombproof souterrains, this fort may henceforth be considered impregnable. The plan of these works has been drawn up by M. Duportail; Major Armstrong showed it to me upon the spot, and I found that it was fully equal to the deserved reputation of the author.

—Chastellux, *Travels in North America*, 1:154–56. *Copyright 1963 by the University of North Carolina Press. Published for the Institute of Early American History and Culture. By permission of the publisher.*

Efforts to revitalize Philadelphia's defenses lasted until the American victory at Yorktown in 1781. Afterward, Pennsylvania virtually abandoned the project.



Chapter VII

WEST POINT: THE KEY TO THE CONTINENT, 1775–1783

About fifty miles north of New York City the Hudson River cuts a gorge through a range of mountains known as the Highlands, the highest ground along New York's eastern waterways. The heights stretch from Stony Point in the south to New Windsor in the north. During the Revolutionary War, control of the Highlands was vital to control of the Hudson, and control of the Hudson was paramount to America's hopes for victory.

Only at the Highlands, where the Hudson forms a series of points, bends, and rocky islands, was the river narrow enough for the rebels' firepower to be effective in protecting their water obstructions and thereby halting the northward advance of enemy vessels. The river bisected the population of the colonies and its crossings were important links in land communication. Moreover, the surrounding valley was a valuable source of supplies and manpower. By stationing his army at a central location on the Hudson, General George Washington hoped to operate on interior lines, that is, to react to the enemy in all directions, his best hope given British mobility on the water.

Mastery of the Hudson River was also crucial to enemy offensive operations in the north and to providing their Indian allies access to eastern New York and New England. On the other hand, fear of the Indians was very great among the patriots and it reinforced their determination to hold the Highlands. Little wonder that West Point, lying in the midst of this region, would eventually be called the "key to the continent."

When the Revolution broke out the rebels held the Hudson, but the lack of defenses made their grasp tenuous. By mid-1775, however, both the Con-

THADDEUS KOSCIUSZKO. *Trained at Mézières, Kosciuszko (1746–1817) was commissioned an engineer colonel in the Continental Army in October 1776. He served with distinction at West Point, in the period March 1778—June 1780, and then in the Southern Department. At the end of the Revolution he returned to his native Poland, where he became a major general in 1789. For the remainder of his life Kosciuszko was active in the Polish effort to resist Russian domination. The portrait is by Charles Willson Peale.*

Independence National Historical Park Collection

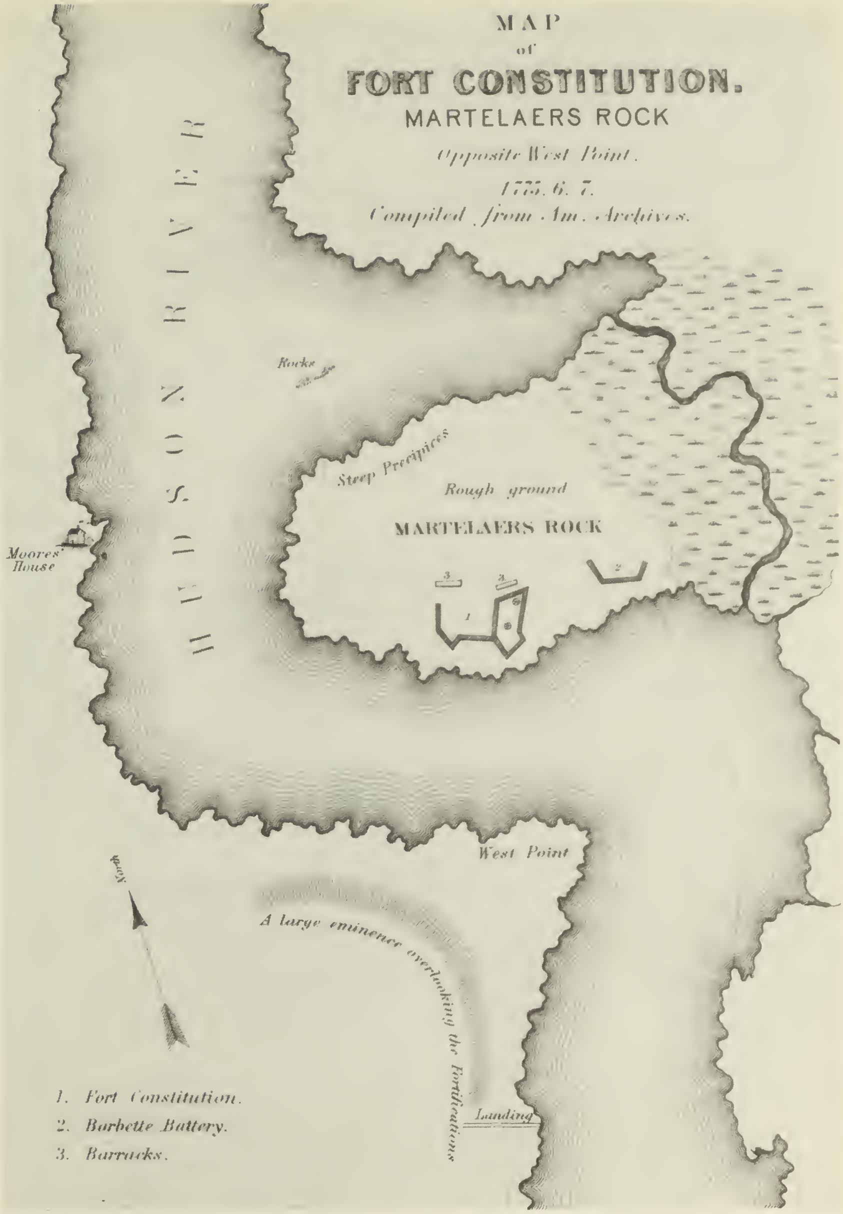
tinental and New York Provincial Congresses had taken action that began the process of fortifying the Highlands. First-hand inspection led a committee of the New York Congress to suggest erecting three forts and constructing a series of booms to block river traffic. New York entrusted the project to a group of commissioners, who in August 1775 hired Bernard Romans to direct the operation. A Dutch-born engineer, botanist, artist, and mapmaker, Romans had limited military engineering experience and lofty ambitions. He had assisted Benedict Arnold with repairs to the works at Ticonderoga and was trying to get Congress to commission him as an engineer officer.

Controversy immediately arose between Romans and his employers. Rejecting plans formulated earlier, Romans wanted to concentrate defenses on Martalaer's Rock (later known as Constitution Island), and he supported the use of firepower rather than river obstructions. Feuding caused delays. The provincial commissioners resented Romans's challenge to their authority and his attempts to get his plan accepted by the New York Congress. Finally the Continental Congress sent a special committee to investigate. The committeemen found the fortifications on Constitution Island not nearly so advanced as they had been led to believe. Even worse, high, unfortified ground across the river at West Point actually commanded Constitution Island. The committee recommended that the point be occupied and also advocated a fort several miles south on the northern bank of Popolopen Creek. Much to the chagrin of the New Yorkers, the insistent Romans took his case to Philadelphia, where Congress supported his plan to fortify Constitution Island while leaving West Point undefended.[1]

New York relieved Romans of further duties; and in February 1776 William Smith, chief engineer in New York City and a more amiable man than Romans, briefly took charge in the Highlands. Smith traced three new works, including Fort Montgomery on Popolopen Creek, but did not stay to direct their construction. By spring the Continental Army began to assume complete responsibility for the area. Washington's fear of a British invasion of New York City and concern over the lack of work in the Highlands roused him to action.

In May Washington ordered to inspect the Highlands' fortifications Brig. Gen. William Alexander, Lord Stirling, the commander in New York; Col. Rufus Putnam, the Army's Chief Engineer; and Col. Henry Knox, commander of the Continental artillery. At the last minute Capt. Winthrop Sargeant, another artillery officer, replaced Knox. The three were the first men with military experience to survey the terrain for defensive requirements.

As elaborated in his report, Stirling chose a spot on the south shore of Popolopen Creek where it emptied into the Hudson as "the most proper place . . . to be made the grand post." There the rebels eventually built Fort Clinton. Stirling's concern for protecting the Hudson works from the



FORT CONSTITUTION. *This map, compiled from* American Archives, *shows fortifications planned for Constitution Island, opposite West Point, by Bernard Romans. He argued that this position ought to be the center of the Highlands' defenses.*

Boynton, *History of West Point*

land side would be echoed by others, including Washington. Although his full report pointed out the need to fortify West Point, Stirling unaccountably omitted all reference to West Point in a special summary prepared for Washington. As a result, no one took action there.

Stirling strongly criticized the works Romans had already erected for their extravagance and inadequacy, and proposed new works to correct the weaknesses. Unimpressed with the effectiveness of New York's commissioners and their artisans, he concluded that "one good engineer, with artificers from the army, might . . . do the whole business as well."

1. "MR. ROMANS HAS DISPLAYED HIS GENIUS AT A VERY GREAT EXPENSE, AND TO VERY LITTLE PUBLIC ADVANTAGE"

Lord Stirling to George Washington.

June 1, 1776

Sir:—Agreeable to your request, I left New York on Sunday last, in order to view the fortifications on the Hudson's River in the Highlands. I took with me Colonel [Rufus] Putnam, Chief Engineer, and Captain Sargeant, of the Artillery. The winds were so adverse that we did not reach Fort Montgomery until Wednesday evening; but, with the help of our boat, we employed our time in visiting several other parts of the river that appeared proper for fortifying. At the mouth, or south end of the Highlands, about four miles below Fort Montgomery, there is a post [Stoney Point] which to me appears well worth possessing on many accounts; should the enemy be in possession of it, we should be cut off from our best communication with the whole country below the Highlands, eastward as well as westward. There is a very remarkable spot of ground [Verplanck's Point], easily fortified, which commands the passage of the river as well as either of the other posts; it also commands the mouth and landing of Peek's Kill, from which there is an excellent road into Connecticut, which is only twenty miles off; on the opposite side is an excellent road into New Jersey and Pennsylvania. In the passage from this place to Fort Montgomery is a large island, which would be very useful to the enemy in their approaches to that place.

Fort Montgomery is situated on the west bank of the river, which is there about half a mile broad, and the bank one hundred feet high; on the opposite shore is a point of land called Anthony's Nose, which is many hundred feet high, very steep, and inaccessible to any thing but goats, or men very expert in climbing. A body of riflemen placed here would be of very great use in annoying an enemy, as the decks of every vessel that passes must lie open to them.

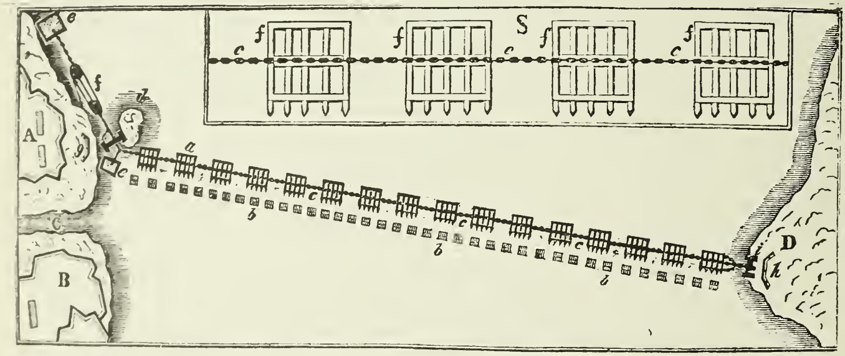
The works begun and designed at Fort Montgomery are open lines, and all lie on the north side of a small creek called Pooplopen's Kill, on the south side of which is a point of land which projects more into the river, commands all the principal works, and is within two and three hundred yards of them. On the top of this point is a level spot of ground, of near an acre, commanded by nothing but the high, inaccessible mountains, at about twelve hundred yards distance; this spot [the future Fort Clinton], I think, should by all means be fortified, as well for the annoyance of the enemy in their approach up the river, as for the protection of the works at Fort Montgomery. Indeed, this appears to me the most proper place I have seen on the river to be made the grand post; and, in my opinion, should be a regular strong work, capable of resisting every kind of attack, and of containing a grand magazine of all kinds of warlike stores. The whole would then command the passage of the river with so formidable a cross fire as would deter any attempt to approach with shipping. Those works built are all faced with fascines, and filled in with strong, good loam; but as they are liable to take fire, the Commissioners who have the care and direction of the works, propose to roughcast the faces of the embrasures with a strong mortar made of quicklime and sharp sand, of which there is plenty at hand. I advised them to try the experiment on part of the work as soon as possible. As these open lines are entirely defenceless on the land side, it will be very proper to erect a small redoubt on the hill, in the rear of them.

Fort Constitution is about six miles above Fort Montgomery, on an island near the east side of the river, and near the north end of the Highlands, which on the west and south sides is bounded by the river, and on the north and east sides by low marsh and small creeks running through it. The works here consist of four open lines or batteries, fronting the river; the two easternmost command the approach up the river very well; the next, or middle line, commands the approach from West Point upwards; the westernmost battery is a straight line, constructed by Mr. Romans, at a very great expense; it has fifteen embrasures, which face the river at a right angle, and can only annoy a ship in going past; the embrasures are within twelve feet of each other; the merlons on the outside are but about two feet in the face, and about seven feet deep, made of square timber covered with plank, and look very neat; he also built a log-house or tower on the highest cliff, near the water, mounted with eight cannon (four-pounders) pointed out of the garret windows, and looks very picturesque. Upon the whole, Mr. Romans has displayed his genius at a very great expense, and to very little public advantage. The works, in their present open condition and scattered situation, are defenceless; nor is there one good place on the island on which a redoubt may be erected that will command the whole; . . . yet every work on the island is commanded by the hill on the West Point, on the opposite side of the river, within five hundred yards, where there is a level piece of land of near fifty acres in extent. A redoubt on this West Point is absolutely necessary, not only for the preservation of Fort Constitution, but for its own importance on many accounts. One also is necessary at the west end of the island, to command the approach that way, and to prevent a landing at the north side of the island. An easy communication by land, as well as by water, may be made with Fort Montgomery from the West Point. . . .

The direction of the works at both these forts [Fort Constitution and Fort Montgomery] is in the hands of Commissioners appointed by the Provincial Congress of New York. Two Commissioners, with four carpenters, two blacksmiths and seven attendants, are at Fort Constitution; two Commissioners, one clerk, fifteen carpenters, and four masons, are at Fort Montgomery; the pay of these amounts to at least eight hundred dollars per month, besides their provisions, etc. One good engineer, with artificers from the army, might, I think, do the whole business as well. . . .

—Boynton, *History of West Point*, pp. 29–33.

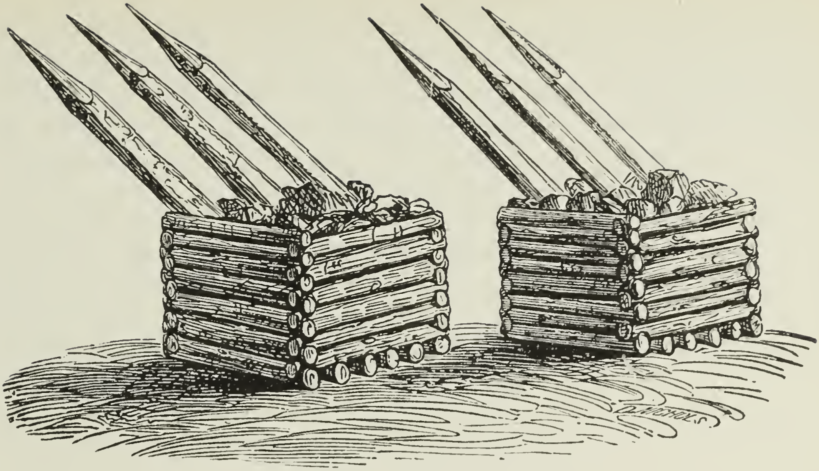
At Stirling's suggestion the brothers George and James Clinton, officers in the New York forces, strengthened Fort Montgomery on the north bank of the Popolopen and placed a breastwork and battery on the creek's south bank. In July Washington sent Thomas Machin, a veteran of the British artillery and co-planner of Great Britain's noted Bridgewater's Canal, to serve



A Fort Montgomery. B Fort Clinton. C Poplopin's Kill. D Anthony's Noſ
a Floats to Chain. *b b b* Booms in front of Chain. *c c c* Chain.
d Rock at which the Chain was ſecured with large Iron Roller. *e e* Cribs and Anchors.
f Blocks and Purchaſe for tightening Chain. *g h* Ground Batteries for defence of Chain.
S Section ſhowing Floats and Chain. *c c c* Chain. *f f f* Floats.

FORT MONTGOMERY BOOM AND CHAIN. *Thomas Machin placed this boom and chain across the Hudson in April 1777, and the British removed them the following October.*

Courtesy New-York Historical Society, New York City



HUDSON RIVER OBSTRUCTIONS. *A drawing depicting the chevaux-de-frise placed in the Hudson from Plum Point to Pollepel Island, north of West Point.*

Courtesy New-York Historical Society, New York City

with the Clintons as an engineer. Soon a new work, Fort Independence, rose opposite Fort Montgomery to protect Peekskill.

Accompanied by Col. Rufus Putnam, Washington made his first visit to the Highlands on 11–12 November 1776. With some foresight, Washington pointed out that it was a mistake to concentrate on the forts along the river. What about the surrounding hills? he asked. The existing forts would be useless if an attack were made by land from the rear. Before leaving for New Jersey, Washington directed Maj. Gen. William Heath, Highlands commander at the time, to correct the problem. Underscoring his concern, Washington left Putnam to assist. Bitter cold weather and a shortage of manpower combined to force a delay in implementing Washington's orders.

While in the Highlands, Thomas Machin also became involved in placing obstructions in the Hudson River. New York leaders had long favored such obstacles, but nothing had been done, in part because of Romans's objections. In mid-1776, however, state officials revived the plan and ordered Machin to lay a chain and boom across the Hudson at Fort Montgomery.

Machin worked through the fall and winter on his tough engineering assignment. At the chosen spot the river was 1,800 feet wide, 120 feet deep, and subject to strong tides. He needed to perfect a chain strong enough to withstand the impact of a ship, yet flexible enough to resist the stress brought on by the tide. Machin contracted with Robert Erskine, the future United States geographer and owner of a forge, to manufacture the iron he needed.

Machin also placed chevaux-de-frise across the Hudson from Plum Point to Pollepel Island, a wide, shallow position north of West Point. He impressed Loyalists to construct the caissons—structures framed with timber and filled with rock—that served as foundations for the chevaux. West Point chevaux, unlike those placed in the Hudson River at New York City, were made of iron-tipped tree trunks wedged at an angle in the stone-filled caissons.

By the end of April 1777 Machin's floating chain was in place. Although the enemy threatened the still-unfinished Highlands posts more than once that spring, the rebels maintained control. As a result a false sense of security, ruffled by only brief moments of concern, came to pervade the Highlands. At the end of summer, when British designs on Philadelphia became clear, attention shifted southward, even though Burgoyne was a real threat in the north.

In October the enemy shocked the rebels by attacking from the land side and capturing the sparsely garrisoned Forts Montgomery and Clinton. Boldly they cut Machin's chain, sailed north, and broke through the chevaux-de-frise. Luckily for the rebels, Sir Henry Clinton, commander of the British expedition, failed to take advantage of his gains. After burning the forts he returned to New York City.

This destruction by the enemy proved a blessing in disguise. Forced to rebuild the Highlands' defenses, the rebels approached the whole problem afresh. The result was a sound, productive reevaluation, unobscured "by blinders of already existing works."[2]

The task began immediately. Congress wanted an Army engineer officer to take charge of the Hudson defenses, where civilian engineers and artillerists had been carrying the burden. Washington dispatched Louis de Shaix La Radière, second in command of the Army engineers, to do the job. Disagreements promptly arose between the engineer and the generals over the design of the fortifications and the role of West Point. In addition, Radière's impetuous personality and meticulous habits led him to clash openly with his commander, the "rough-and-ready" Maj. Gen. Israel Putnam.

After a month-long survey, Radière recommended concentrating defenses at Fort Clinton, several miles below West Point. Reflecting his French military training, he envisioned a fortress capable of withstanding a classical siege. Putnam and the other generals in the Highlands, while not disputing Radière's technical expertise, felt his judgment in these circumstances was impractical.[3]

Putnam turned to New York officials for help. They listened to Radière's arguments in favor of Fort Clinton but urged Putnam to proceed at West Point instead. Not only could West Point be completed sooner than Fort Clinton, the New Yorkers argued, but also workers could erect a more effective chain and supporting batteries there. And, after all, the rebels' primary goal was to close the river.

Radière was overruled and he was angry. He had presented several carefully prepared reports and sketches supporting his views, only to have all his arguments rejected. Putnam ordered the French officer, whom he characterized as "an excellent paper Engineer,"[4] to proceed with the works at West Point. At the same time the commander reported to Washington: Radière "seems disgusted that every thing does not go as he thinks proper, even if contrary to the judgment of every other person."

Radière decided to take his case to Congress, much as Romans had done earlier. At this stage he seemed more intent on making a point than on winning the argument. Indeed, after his temper cooled, he concluded that it was "better to fortify a place less good than to do nothing at all," and agreed to trace the fort at West Point. In the following letter, Radière spelled out his reasons for preferring Fort Clinton. Note his concern for West Point's vulnerability and his conviction that the loss of a fort there would "be much worse for the country" than the loss of Fort Clinton.

2. "I STILL THINK FORT CLINTON IS THE BETTER"

Louis de Shaix La Radière to a member of Congress.[5]

At Fishkill, 13 January, 1778

Sir:

I am so hurried by the express which General Putnam is sending to Congress that I cannot write you in English. I wrote to the President of Congress but as he will surely not understand my English I beg you to be so good as to explain to him the following details as well as to Congress. . . .

A council was held yesterday relative to the fort which is to be built on the banks of the Hudson River. I read a Memorial upon the subject. It was resolved to fortify a place called West Point, opposite the old fort Constitution six miles above fort Montgomery and eight below New Windsor; this was done contrary to my advice, which was that fort Clinton was preferable. As it is better to fortify a place less good than to do nothing at all, I practically consented since I am going to trace a fort at the place indicated; but I still think fort Clinton is the better. I do not speak at all of the localities lower down the river since I have never been able, in the investigations I have made with the Generals, to descend the river below fort Clinton.

The principal reasons which incline me to fort Clinton are that the enemy cannot, without great difficulty, lay seige to fort Clinton because the ground is narrow and rocky, without earth, so that the Enemy would risk every moment to have their communications broken with their ships unless they disembarked from 10 to 12 thousand men. For this reason a very small fort would suffice. Also, the situation is such that there will be no need to build a fort on the opposite bank to hold the chain that bars the river.

At West Point the enemy can besiege the place and occupy a ground where he will not be more than a mile from his vessels and can support at the same time both a siege and an attack. If this fort is taken it will be much worse for the country than if it were fort Clinton.

The fort placed at West Point has the advantage of being situated in a place where the navigation is more difficult but it will be necessary to build a fort on the opposite bank of the river.

This fort is so situated that it can be taken in fifteen or twenty days, perhaps less. Nevertheless I hope things will not go that far, but in a comparison it is necessary to weigh exactly what is for or against each.

—Kite, *Duportail*, pp. 86–87.

In a separate note to Washington, the French engineer revealed plans to plead his case at headquarters. But Washington favored the decision to fortify West Point and was troubled that disputations were dangerously delaying progress. "We shall lose the Winter," he admonished Radière, "which is the only time we have to make preparations for the reception of the enemy."[6]

Begrudgingly Radière next came forward with elaborate plans for a massive masonry work, with walls fourteen feet high and twenty-one feet thick, at West Point. An impractical proposal indeed, grumbled his American commanders. There was too little time, and money was scarce. In his capacity as president of the Continental Board of War, Maj. Gen. Horatio Gates cautioned Putnam that Radière would not complete the works "till the next campaign is ended, altho' 5000 men should be at his direction." Gates thought Putnam should use Radière only sparingly and concluded: "We wish to avoid offense to any foreigners who have interested themselves in our cause; we would treat them with all possible respect: But we must not sacrifice or hazard our safety from a point of delicacy."[7]

Throughout the winter of 1777–78, bad weather, changes in command, problems with workers, and the disagreement between Radière and his superiors brought fortification to a standstill. Rather than "hazard his reputation on Works erected on a different scale, calculated for a short Duration only," Radière left the Highlands for camp at Valley Forge.

Lacking confidence in Putnam's ability, Washington appointed a new commander, Maj. Gen. Alexander McDougall. Washington then persuaded Radière to return to West Point and confidently reported to McDougall: "I can safely recommend him [Radière] to you as a man who understands his profession, and make no doubt of his giving you satisfaction, both in projecting and executing the works required for the defence of the River."[8] Kind words indeed for a man whose actions had given Washington so much concern, but the Commander in Chief could hardly afford to alienate any of the French engineers serving as volunteers in the Continental Army.

When Radière returned to West Point at the end of March 1778, he immediately found himself in the midst of another controversy. This time it involved a new engineer, Thaddeus Kosciuszko of Poland, who had joined Machin at West Point in Radière's absence. Unknown to Washington, Congress had sent Kosciuszko, a friend of Gates and the engineer hero of Saratoga, to replace Radière. McDougall took an immediate liking to the new engineer, declaring: "Mr. Kosciouszko is esteemed by those who have attended the work at West Point, to have had more practice than Col. Delaradiere, and his manner of treating the people more acceptable."[9] The last point was particularly important from the commander's point of view.

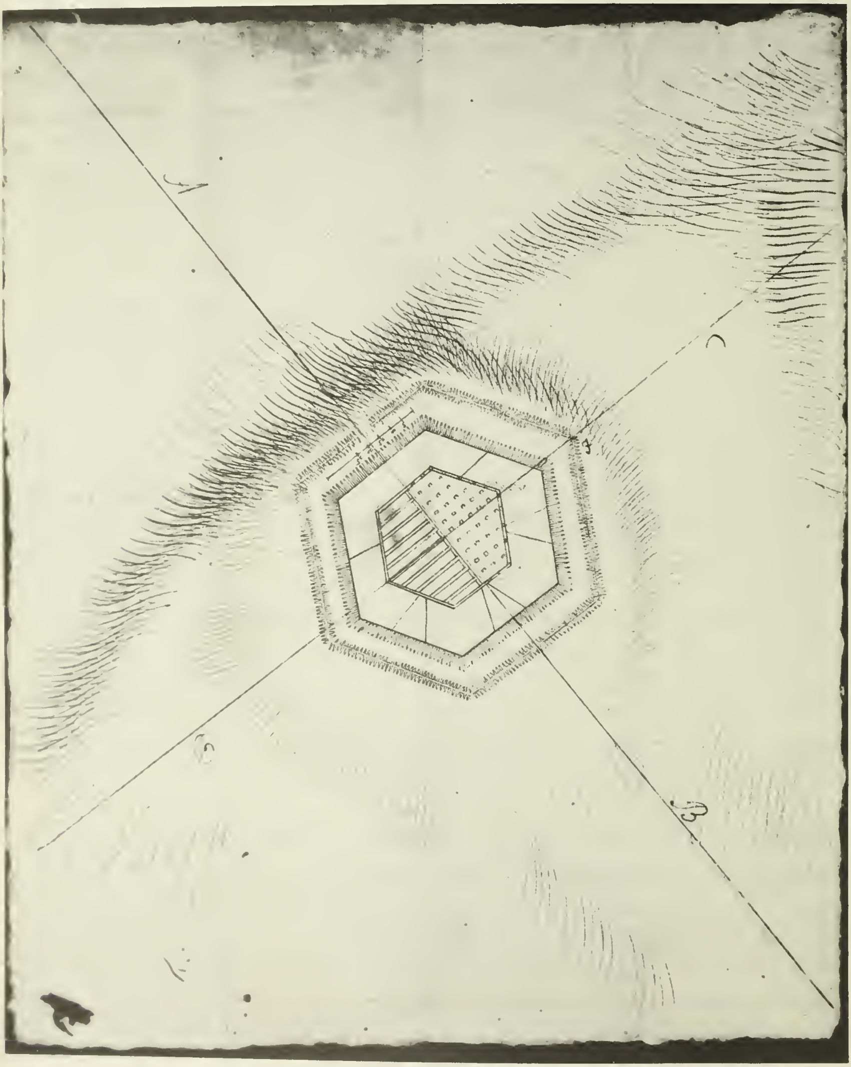
Radière believed it unnecessary to build either redoubts or forts on the hills behind West Point; Kosciuszko, remembering Ticonderoga, strongly disagreed. At one point Radière caustically charged that Kosciuszko did not know his duty.[10] The two engineers got along so poorly together—they even disputed rank—that McDougall did his best to keep them apart. In April Washington finally interceded. He recalled Radière to Valley Forge, noting that Kosciuszko seemed "better adapted to the Genius and Temper of the people."[11]

Despite Radière and Kosciuszko's feud, substantial progress was made during April in fortifying the Highlands. The British stayed away because their resources were severely strained now that the French had entered the conflict. McDougall accepted Kosciuszko's plan to place works around Fort Arnold, the main work at West Point. Brig. Gen. Samuel Parsons, commander at the point, called Rufus Putnam and his 5th Massachusetts Regiment to West Point because of Putnam's proven knowledge of engineering. In fact, the former Chief Engineer took charge of the largest work planned by Kosciuszko, a fort 200 feet in diameter atop steep-sided Crown Hill. Parsons also put some of his own Connecticut troops to work on three redoubts planned by Kosciuszko for a level ridge below Fort Putnam, as the Crown Hill work was soon called. James Clinton directed construction of Fort Arnold.

At West Point on the last day of April 1778 Machin again demonstrated great skill in directing the placement of a river obstruction. Pleased with his earlier performance, New York authorities had engaged him the previous December to work both on fortifications and on a new chain. Seeking to avoid problems encountered earlier with the chain at Fort Montgomery, Machin ordered thicker links for the West point, or "great chain," as it became known. He chose the site with care. Workers painstakingly assembled the chain at New Windsor and then floated it on rafts downriver to West Point.

Over the next several months work proceeded steadily under Kosciuszko's direction despite excessive heat, changing command, and shifting troops. Throughout the summer the Pole commanded several companies of blacksmiths and carpenters, as well as fatigue parties drawn from the line.[12] In mid-July he conducted Washington on his first inspection of the new works at West Point. The batteries — built of dirt and wood because masonry required too much time — now mounted forty-two guns.

Washington said little to indicate dissatisfaction with the state of West Point's defenses, but he must have felt some disappointment. Only a few days later Col. William Malcolm, the new commander at the point,

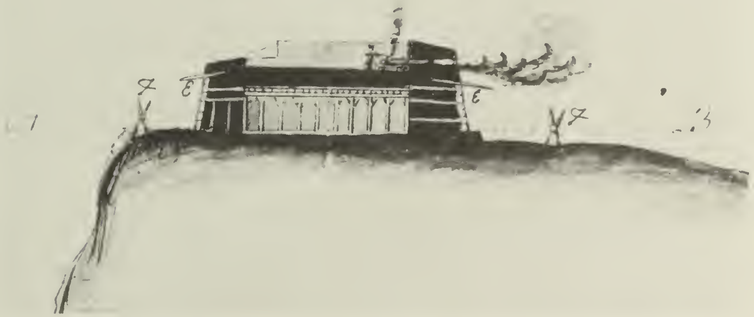


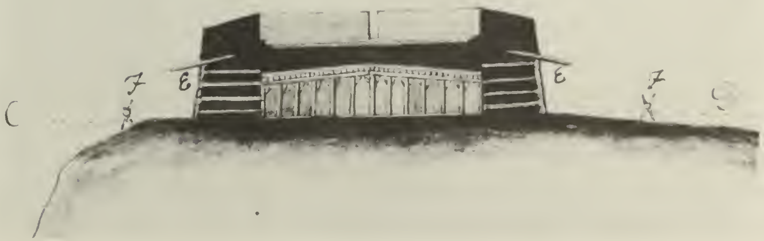
ROCKY HILL REDOUBT. *After his climb atop Rocky Hill in August 1778, Kosciuszko sketched these plans for a six-sided fortification that would be known simply as Redoubt No. 4.*

McDougall Papers, New-York Historical Society, New York City declared with obvious exaggeration: "The works are not worth a farthing." Admittedly there was much work to do. Malcolm further complained to Parsons: "Here I am holding committee among spades and shovels . . . the more we do the more we find we have to do. Why did you not begin to move the mountain, rather than add to its magnitude?"[13]

Hoping to retake New York and weary of past disappointments from working through subordinates, Washington now became directly involved in even the most minute affairs relating to the Highlands. Before long Malcolm accepted his task more cheerfully too.

Near the end of August, Kosciuszko climbed atop Rocky Hill, located about one-half mile west of Fort Putnam and rising 200 feet higher. He at once observed the threat posed by that position. Not only could artillery mounted on Rocky Hill control the interior of Fort Putnam, but an attacking force could move with ease against the fort unless covered from above. Just as Kosciuszko's memory of Mount Defiance had earlier convinced him of the need for Fort Putnam, it now made a redoubt on Rocky Hill obligatory.





The next month Washington ordered Chief Engineer Louis Duportail, whose engineering advice he most respected, to evaluate the West Point defenses. Duportail faulted Kosciuszko's layout of Forts Putnam and Wyllys, downplayed the need to fortify Rocky Hill, and praised the plan of Fort Arnold executed by Radière. The Chief Engineer also stressed that masonry or bricks ought to be used at Fort Arnold, a point argued earlier by Radière but disputed by Kosciuszko. Constitution Island—earlier the center of Romans's defensive plans—had been virtually ignored, but Duportail proposed "three small works" there to make West Point "perfectly secure."

Duportail's first report on West Point also underscored a fact sometimes forgotten: the West Point defenses were primarily designed to protect the great chain. He proposed measures to prevent damage to the chain from artillery fire, and he suggested postponing work on the New Windsor chevaux-de-frise. Down to several misspellings of Kosciuszko's name, the report reflected genuine animosity toward Kosciuszko, who, after all, had sharply criticized Duportail's associate, Radière.

3. DUPORTAIL FINDS THE WORKS "PERFECTLY FULFIL THE OBJECT WHICH IS PROPOSED"

A report to George Washington on the Highlands.

White Plains, 13th September, 1778

The Works which are in hand at West Point and some inconsiderable ones, which it is necessary to add to them, will, with the help of the chain, perfectly fulfil the object which is proposed,—that of hindering the enemy's remounting the North River.

Fort Putnam, which is as it were, the key of all the others may be rendered almost impregnable. There is indeed a height, which commands it [Rocky Hill], but besides that this height may be taken possession of with a redoubt, it would be very difficult for an enemy, even when master of it to bring heavy cannon there. Besides it would be too far to make a breach. This fort has nothing to fear but a bombardment or escalade with respect to a bombardment, the mean to make it ineffectual is to have bomb-proofs sufficient for three fourths of the Garrison, magazines, hospital, etc.—I am told Col. Koshucsko proposes, at this time to begin one; but which will not suit more than 70 or 80 men. This is far from sufficient. There must be another, the place and size of which, I have pointed out to the Captain who conducts the works.—It will contain about two hundred men—with respect to the escalade, to prevent its success, the side of the fort which looks towards the river and is the most accessible, as well as that which looks towards Fort Arnold, must be raised a great deal more than it is, and besides the palisades and chevaux de frise, abatis must be made in front. The roof of the great bomb-proof, which I propose, may be made use of to collect the rain and conduct it into the Cistern. This will always be a small resource.

Fort Willis [Wyllys] does not appear to me well traced. It ought to be put entirely upon the declivity which looks towards the River, the force next Fort Putnam following the ridge of the eminence. In this manner it would have overlooked equally all the valley between Fort Putnam and itself and all its interior would have been under cover of Fort Putnam; the face next the river would have extended to the very border of the declivity; and the work in every respect would have been a great deal stronger. In its present position it is too large, its parapet makes too large a circuit. It will be best perhaps to rebuild this fort altogether; if this is not done, to remedy its inconveniences, the face opposite Fort Putnam must be raised not so as to cover the interior, which I am told Col. Kosciousko proposes, because it must be prodigiously elevated to answer that purpose—but instead of this, I would prolong the eminence which is in the middle of the work, and improve it into a Traverse, to extend the whole length of the work—I would then reject a third of the work on the South as altogether useless--the bomb-proof will be backed by the traverse above-mentioned.

I should have preferred to the Redouts which are in front of the Redout Willis, on the South side, and which require for their defense four or five hundred man—a small inclosed work to secure the possession of the eminence and protect the batteries in front—but for the present, matters may be left as they are.

Fort Arnold appears to me to be pretty well situated and traced—but if the intention of Col. Kosciusko is to leave the sides next the River at the present height—(as appears to be the case) I cannot approve it—they are exceedingly liable to an escalcade—it is proper to elevate them, and even to make a small covert way without having good palisades in front, to secure the body of the place against all surprise.

The scantlin for the Bomb-proof appears to me too feeble—the top will be almost flat—What is made of earth ought to have been of masonry or bricks—however I forbear enlarging upon this subject, because time will hardly admit of a Remedy—the Stuff being squared, and ready to be put together—observing only that the work should be sunk more in order to furnish a greater thickness of earth for the roof.

There is below Fort Putnam, a battery nearly round, which is extremely well placed for battering the Vessels which should approach the Chain—but its situation likewise exposes it to the fire of the Ships—at least as it is much advanced, the fire of the tops would injure the Gunners, and the more, as by the form of the battery they are collected within a very small space—it appears to me advisable, to raise the parapet of this battery several feet—and to cover the embrasures from the top of one merlon to another—so as not to interfere with the working of the Guns—altho it is equally necessary to secure the Chain on the left-hand Shore of the River—it seems to have been little attended to—there is no inclosed work on this side to hinder the enemy from debarking a sufficient number of men to get possession of the ground and cut the Chain—there is only a battery which may answer some good ends—but cannot prevent the enemy from doing as above mentioned—With three small works we shall render the point perfectly secure—the *first* to be placed where the block house [on Constitution Island] stood—it is sufficient for it to contain about sixty men—its end is to afford an immediate defense to the Chain and its extremity—against a hardy enterprise, which a few men are engaged sometimes to undertake by dint of money or other recompense.—The parapets ought to be of wood in order to take less room—and sufficiently elevated to cover the area.

The *second* Redout should be placed on a steep eminence which commands all the other rising ground in the island.

The *third* on an eminence in the rear of the newly constructed battery—these two Redouts ought to be made for 150 men or 200 at most.

There was a battery, the remains of which are still in existence, (below Fort Independence)—it was perfectly well placed for battering the enemy's Ships—it ought to be rebuilt, with a strong parapet of earth—and as this battery is low and exceedingly exposed to a plunging fire from the Tops of Ships—the parapets must be high, and terminated by a Roof of thick plank for the protection of the Canoniers—this battery as well as that which is just finished, will be interlocked by the three Redouts—and be in perfect safety—With these works we shall be completely masters of the Island.

As to the Chain itself, I would not have it floating on the surface of the Water—which exposes it to be laid hold of by machines prepared for the purpose, on board the Vessels which may approach—but the greatest danger arising from this would be the breaking it by Cannon Shot—when a vast number comes to be fired on both sides in a contest between the enemys Ships and the batteries—I should think it more eligible therefore to suspend the Chain three feet below the surface of the water—because as the greatest number of the Shot, bound when they strike the water—there would be so many ineffectual in respect to it—besides, the matter would be very easily executed—by placing the floats above instead of below the Chain—and having another Chain made fast at each end to the great one, and carried above the floats—by these means the great Chain may be supported at the depth which is just suitable—if a Shot should carry away the Chain, by which the great one is made fast to the floats—the whole mischief that would result, would be that the chain in that place would douse a few feet more.

There are so many accidents by which an iron Chain may be broken, that it would be prudent to have a stout cable in reserve, to supply its place in part for a time.

Every thing that I have explained being finished—1800 men will render us completely masters of the River; and put us out of reach of the enemys enterprises. At least, the Resistence that may be made will allow ample time for the arrival of Succours, however remote the Army may be.

The following is the distribution of these Troops as nearly as can be judged.

In Fort Putnam [probably fort Arnold]	700
Willis Redout	200
Fort Putnam	400
Small work above Fort Putnam	100
For the Works on the Island or Peninsula, on the left-hand shore	400
	1,800

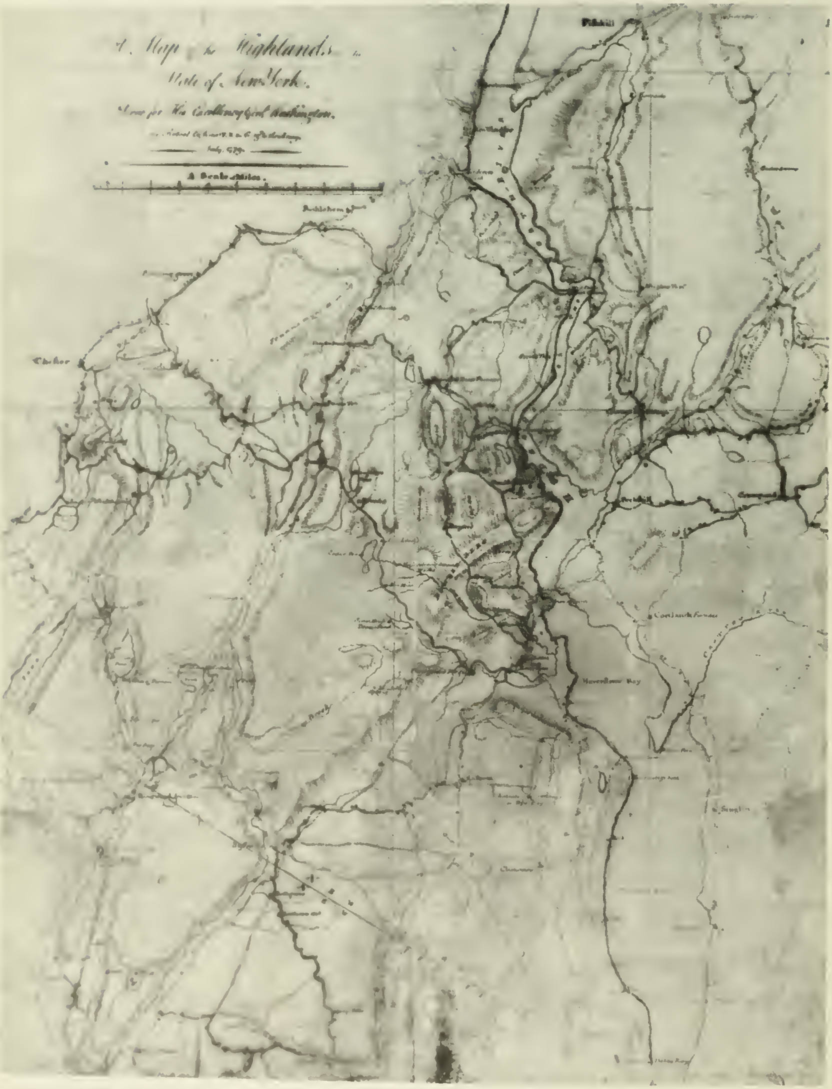
For the present moment, if we except the batteries against Ships—the works are not in a state of defence—but a little time would be sufficient for completing fort Putnam which is the most important—the Redouts on the Island on the left-hand shore—are likewise objects of the first attention.

His Excellency had ordered me to give him an account of the expenses arising from all these works to the present time—it is not in my power to present any thing on this subject, not having seen Col. Kosciousko, who alone is possessed of these facts—I am going to write to him for this purpose.

I was likewise at New Windsor—The River appears to me very wide in this part for a defense of Chevaux de Frise—besides the Chevaux de frise themselves appear to me to be very weak—and I can with difficulty persuade myself that a Ship would be much embarrassed by them—and indeed until West Point is completed—I do not think we should occupy ourselves about New Windsor—I shall therefore forbear adding any thing farther relative to it.

—Washington Papers, roll 51.

With Duportail's report in hand, Washington soon viewed the works at West Point and heartily endorsed his Chief Engineer's plans. Customarily kind words from Washington eased Kosciuszko's injured feelings, but there was no question that Duportail's views would prevail.[14] After the inspection Kosciuszko reported to Gates: "Conclusion was made that I am not the worst of Inginier."[15] As a result of Duportail's suggestions, new construction


A Map of the Highlands in
State of New York.
Done for His Excellency Genl. Washington.
July, 1779.
A Scale of Miles.
Fishkill
Chester
Cortlandt Furnace
Haverstraw Bay

began on Constitution Island, and Fort Putnam got a larger bombproof and cistern.

As chief engineer at West Point, Kosciuszko was responsible for maintenance of the great chain. During the winter of 1778, for example, he designed a machine to simplify removal of the chain from the river, a process that had to be repeated each winter. He also refurbished the chain's log supports with tar and lime and replaced rotten logs.

The West Point fortifications General McDougall viewed at the end of 1778 were well under way; but considering the expenditure of labor and money since his last assignment there a year earlier, a surprising amount of work remained. In truth, incompleteness seems to have been the status quo throughout the Highlands during most of the war. Although regarded as the "key to the continent" and America's Gibraltar, West Point was completed slowly and constantly needed maintenance. Many factors were involved. Washington frequently was torn between keeping troops there and moving them elsewhere. Commanders came and went. The British threat waxed and waned. Winters were harsh and supplies were often wanting.

Beginning in December 1778, Kosciuszko gained an able—and compatible—assistant in Lt. Col. Jean Baptiste de Gouvion. Yet Duportail continued to find Kosciuszko's efforts inadequate. In May 1779 the Chief Engineer made his views emphatically known to Congress, reiterating the crucial significance of West Point. Of greatest concern to Duportail was his fear of being blamed should the position fall. He defended himself on the grounds of not having authority even to require monthly reports from Kosciuszko, and complained of Congress's failure to appoint a commander in chief of the engineering department and thereby clarify responsibility within it.

4. "I DO NOT THINK MYSELF RESPONSIBLE IN ANY MANNER FOR THE NEGLECTS . . . OF THAT FORT"

Louis Duportail to John Jay, President of Congress.

Philadelphia, May 11, 1779

Honble. Sir

. . . His Excellency the Commander in Chief ordered me last year to Fort West Point on the North River, to see in what Condition were the Works then Erecting and what new ones it was necessary to add. After I had ac-

THE HIGHLANDS AND NORTHERN NEW JERSEY. *In 1779 the geographer's department prepared this map of the roads connecting the Highlands with New Jersey to assist Washington in planning troop movements in defense of the Hudson.*

Historical Society of Pennsylvania

quainted Genl. Washington with my Observations and imparted him my Ideas [see preceding document] (which he approved of) I gave, according to his Orders, the necessary Directions to the Officer [Kosciuszko] Entrusted with the fortifications of that Place, pointing out the new Works that were wanting, those that were the most pressing, the Way of making them, etc. I then thought that if the remaining part of the Autumn and as much as possible of the Winter was well employed, West Point might be in a State of Defence *against the first of May*. But unhappily, I have lately heard, that *almost nothing has been done*, and all is in nearly the same Condition as when I left it in September. However, Sir, you are of the State of New York, Your Excellency is probably acquainted with the Situation of the place, and you know of what importance it is to us to remain in possession of it. It is the Key of the North River, and if the Enemy is once master of its Navigation, the Communication between New England and the other States is Entirely cut off; this Communication is however necessary to our Army, which cannot Even Subsist without it, on either side of the River, from the want of Cattle on one side and the Want of flour on the other. Thus the loss of West Point must necessarily Expose a part of the Country, to be without Troops for its defence, and perhaps, as I have already Said, the whole Continent, by the great difficulty of maintaining an Army. This is, methinks, a matter highly interesting for the United States, and I make no doubt, that when the English receive sufficient reinforcements, to come out of New York and open the Campaign, their first Operations will be against Fort West Point as it is the only Way for them to do anything decisive. It should then be our care to put it in a proper State of defence.

No doubt Your Excellency is anxious to know, what relation there may be between these Speculations and my affairs. It is this: If the Enemies happen to take posession of West Point, when the unhappy Circumstance which must necessarily arise from such an Event, shall have carried grief in the minds of many, it will be natural to seek the cause of that misfortune, and a person to whom it may be imputed. And perhaps that Congress or the Commander in Chief will betake themselves to me, and ask of me, Why I did not take care that the Works at West Point should be carried on with regularity and dispatch, and why, when they have been interrupted, I have not given any Notice of it My answer will be this: "*I had no right to demand the necessary informations from the Engineer entrusted with the fortifications of that Place: When I went there in September by the Commander in Chief's orders, I requested him to render me an account Every month of the Condition of the Works, of the difficulties of every kind that might arise in the Execution:—He has not done it.* But that Officer is not in any manner to be blamed. He [received] no Orders in writing for that purpose from Congress or the Commander in Chief. This Winter, Genl. Washington, who has well conceived of what necessity it was to have somebody at the Head of the Engineer's Department, has desired a

Regulation which among other things should establish such an officer. The Regulation has been made, and approved both by Congress and the General, but no Commander in Chief of that Corps has yet been appointed."

I expect Every Day the resolution of Congress on this account. I have often urged the Honorable Board of War to make new representations; my reasons have always been that the state of the fortifications of Some necessary and important Points for this Campaign, *should be known*, and particularly that of Fort West Point. Unhappily a resolution has been delayed to this instant and I find myself obliged to declare to Congress, that I do not think myself responsible in any manner for the neglects or interrruptions which may happen in the Works of that Fort, nor shall think myself answerable in the future, as long as I have not the authority to have the necessary Accounts rendered me, by the Engineers Entrusted with the Fortifications, and the right to make to the proper persons the necessary representations, in case of any interruption.

—Papers of the Continental Congress, roll 181.

A few weeks later on June 1, after the rebels abandoned their unfinished works there, the British took Stony Point without firing a shot. The enemy also captured Fort Lafayette, a completed work across the river on Verplanck's Point. When Clinton failed to extend this offensive to West Point, Washington had the British positions below King's Ferry reconnoitered exhaustively to determine the feasibility of retaking them. Although he now commanded in the line, Rufus Putnam lent his engineering experience to the effort. Putnam made the following report to Washington.

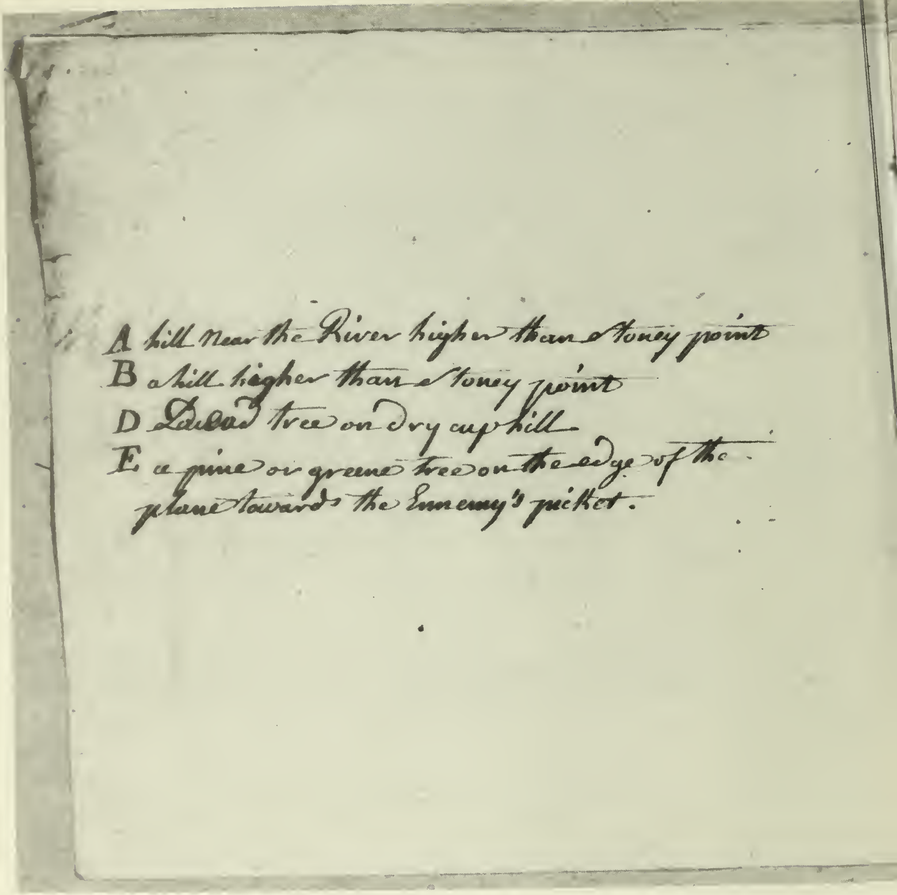
5. "I HAD SEVERAL FAIR OBSERVATIONS AS THE SUN PASSED THROUGH THE OPENINGS OF THE CLOUDS"

Rufus Putnam to George Washington.

Constitution Island, July 13th, 1779

Report of observations made at Vanplanks Point taken this Morning.

The Roof of the Block House in Fort De La Fyatte [Verplanck's Point] taken off Proverbelly with a Designe to add another Story of Timber work.—The Block house on Stonney hill quite inclosed with a parrepet. A New flash or Redan in a line of there other works Next the Block house on the North River. A New work on the old Barbitt battery,—built by the americans Enlarged and Eambrasure made which Rake the beach and

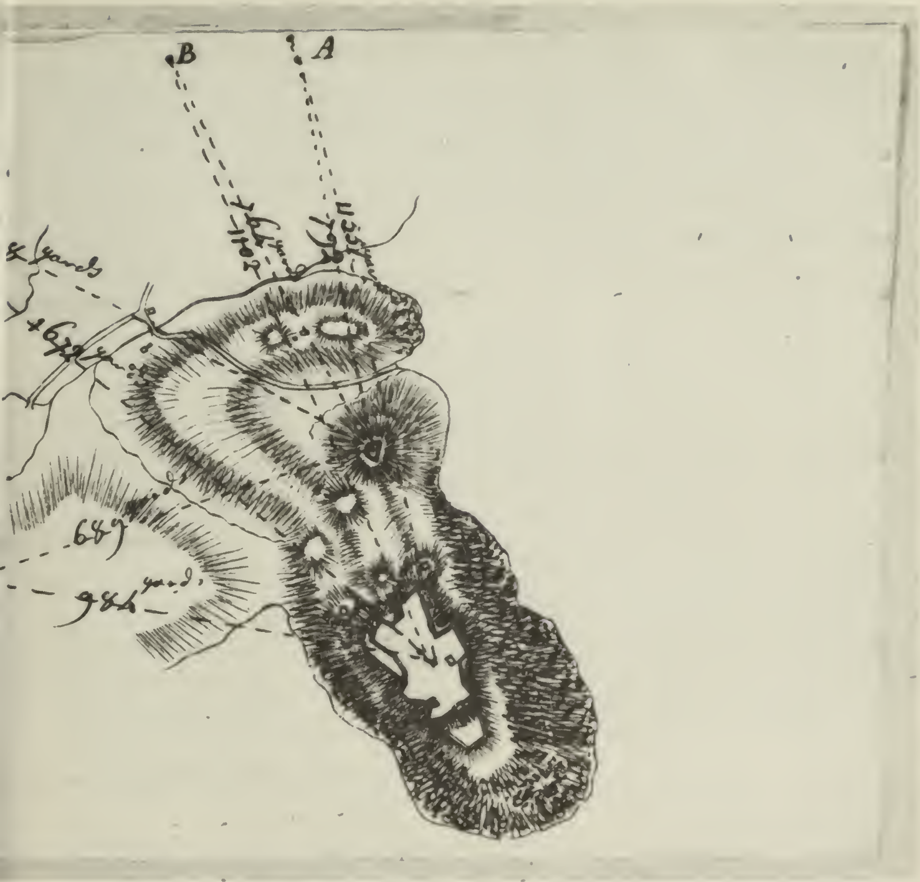


A hill Near the River higher than Stoney point
B a hill higher than Stoney point
D Dead tree on dry cup hill
E a pine or greene tree on the edge of the
plane towards the Enemy's picket.

STONY POINT, NEW YORK. *Although no longer an engineer officer, Rufus Putnam drew this plan for Washington after reconnoitering the area surrounding Stony and Verplanck's points in 1779.*
Historical Society of Pennsylvania

flats towards the bridge. The abbette (abatis) in front of there works continued down the bank and across the beach to Low warter marke.

From the Bridge across the Marsh towards the Stone house is about Eighty Rod. The Beach here at low warter, is about three Rod wide nearly on a levil with the Marsh where was a Small fier where I apprehend a night picket is posted. After you leave the Marsh between the high bank and the warter the beach is not Quite So wide. The distence to march here before you are in the Rear of there line of works is also about Eighty Rod directly in front and under the Rake of the afore Said american battery which is Retiered from there line of Works and is built on a part of the Point that



projects more in to the bay and Servs as a kind of flank and in front of which there Encampment must be entered.

I had in my party a Number of intiligent Soldiers of Colo. Nixon Regiment. . . . I proposed to them last eving to pilate me across the crick below the bridge in ordor as I pretended to take of Some of the out guards. . . .

. . . I took my Stand this morning before light a few Rods from the old church. The morning was not So favourable as I could have wished but I had Several fair observations as the Sun passed through the openings of the clouds. I could See very little of the works on Stonney Point. Northing to contradict my observation made from the hill on the west Sid the River.—On the beach South of the crick that Sepperets Stonney point or Island from the main I discovered a Small guard Round a fier—and on Vanplanks Point neare the edge of the hill coming onto the Marsh from the Stone house towards the bridge was also a fier where I conclude they had a picket in the night and from which a Sentry it is most proverble is posted on the beech at or neare the Bridge. Haveing made all the observations in my power and being determened to come Immediately to camp I marched my party which consisted of fifty (Rank and file) and paraded them in open Vew Near the church. They maned there works and the guad at the Stone house Turned out which Consisted of one officer and about 20 men. The Excessive Rain while I was out prevented my being abel to perform the Service Sooner. . . .

—Washington Papers, roll 25.

Its natural surroundings made Stony Point a forbidding target, and the British thought they had secured it against either a quick thrust or a siege. The audacity of an attack tempted Washington. Thus on 16 July 1779, rebel forces using information reported by Putnam and others and commanded by Brig. Gen. Anthony Wayne dramatically recaptured Stony Point. The sometime engineer officer Lt. Col. François Fleury, now also a battalion commander, was the first man to enter the enemy works. His performance in combat was singular: he stormed over the walls and boldly pulled down the British flag. Though the rebels abandoned the fort only two days later, Fleury had earned himself a congressional silver medal, the only foreigner so honored during the Revolution.

Washington relinquished Stony Point because he lacked enough men to hold it and take Verplanck's Point as well. The British promptly recovered Stony Point and fortified it more extensively than ever. For a time Washington considered another assault but abandoned the idea on the advice of his council of war.

As a member of that council, Duportail opposed a renewed attack on either Stony or Verplanck's Points. This time, Duportail realized, the Americans would have to confront more formidable defenses. His plan to menace the British positions was a good one. His view that the enemy would soon find themselves overcommitted was remarkably prescient, for on October 21 the British abandoned the fort, leaving it in ashes.

6. "IT WOULD NOT BE PRUDENT TO RISK THE LOSS OF A GREAT NUMBER OF MEN, UPON HOPES NOT WELL FOUNDED"

Louis Duportail to George Washington.

July 27, 1779

West Point being to us a point which it is of the greatest importance to preserve and to put once for all in a state of defense. I think that we ought not to touch the fund of troops necessary to the defence of this Post, in its present state, and to the construction of the Works already undertaken. According to what His Excellency has been pleased to submit to our views, it appears that we have there about 5000 Men. This is perhaps more than sufficient to receive the Enemy 'till the rest of the Army can arrive to their succour, but it is not too much for the Work we are carrying on. I therefore think it best to leave them there. The question then is, what we can do with the rest. Can we attack Stony Point or Verplanks point?

The English having augmented considerably the number of their Troops at Stony Point, labouring to inclose their Works and probably keeping themselves more upon their guard than heretofore, I think that we ought not to attack them because we should be likely to lose a good many Men and perhaps without success. Besides, according to my conception of the matter, we should not have any great advantage by gaining possession of Stony point; because we must be also masters of Verplanks. . . . If we should attack Stony Point, it could only be to possess ourselves of the Garrison and of the Magazines, but tho' we have succeeded once without loss, we must not believe, that we should succeed in the same manner a Second time; and it would not be prudent to risk the loss of a great number of Men, upon hopes not well founded, who may become very necessary to us. The arrival of Lord Cornwallis and the strong appearances of an embarkation, seem to indicate that the English have received, or are sure of receiving a reinforcement, which enables them to send Troops to Carolina or elsewhere. Perhaps therefore until we know with what number of Troops we Shall have to do, it will be proper not to adventure our Troops in expeditions more than uncertain.

We cannot propose to ourselves, to attack Stony Point by regular approaches. The ground which is on a level with it, or which commands it, is too distant for the batteries erected there, to be able to batter the Works to advantage and render them more easy to be carried by assault, in which it must ultimately end. Besides, by the disposition of the Roads, we should run great risk of losing our cannon, Mortars, etc.

What I say respecting the attack of Stony Point *Sword in hand*, applies itself to Verplanks point. But as to attacks by means of Batteries, Verplanks point is very susceptible of them; and I think if the enemy should be imprudent enough to abandon Verplanks point to its own force, and there is no *body* of Troops near enough to support it, we ought not to hesitate to make the attack, because we risk nothing. If the Enemy arrives in time to bring them succour, we get rid of the business by retiring. I think therefore that we ought always to be ready for this enterprise.

Though I do not think that we ought to attack Stony point or Verplanks Point by assault or otherwise, unless in some extraordinary circumstances which may present themselves, nevertheless it appears to me essential to menace them continually. I should then have been glad if 12 or 1400 Men had been left at the outlet of the mountains above Stony Point and a like Corps at the Continental Village. These Corps will absolutely risk nothing unless they should suffer themselves to be surprised, and even this would be very difficult. They could be turned on neither side and they have always their communication secure with West Point. By showing themselves always ready to attack the Forts, they oblige the Enemy to have within reach to support them, a Corps of at least three thousand Men, to have nothing to fear. Then which will appear singular, the possession which the Enemy have of Verplanks point and Stony Point will turn against them and become an advantage to us. For here are 5000 Men employed to maintain a Point, which is of no great consequence to us. Let us add to these, the number of Men they must have at New York for the Security of that place, and on this side of Kingsbridge to support readily the three thousand Men advanced, unless they keep their Men upon the Water; and we shall see that the Enemy, by having posted themselves at Kings ferry, have imposed on themselves the necessity of establishing a chain of Posts from Kings ferry to New York, which will prevent their having so many for distant operations; and thus we shall perhaps save the Country from pillage.

—Washington Papers, roll 25.

Following a now-familiar pattern, Washington renewed his commitment to West Point after the American capture and abandonment of Stony Point. He established headquarters at West Point. Then, after viewing Fort Putnam, he decided that Rocky Hill—as well as three additional high points to the south and southwest and still others across the river—should be fortified immediately. Washington had always appreciated the possibility of attack from the rear, while some advisors had found it impossible to shift their attention from the Hudson. Yet Kosciuszko had first urged fortification of Rocky Hill and had even drawn the plans in 1778, fully a year before Washington's intervention.

In August the Commander in Chief directed Duportail to make yet another survey of West Point's defenses. In a masterful reassessment Duportail considered the consequences to both sides of losing control of the Hudson. After months of anxiety, he now welcomed an attack by the British, assured that it would mean ruin and dishonor for them. The rebels stood in a position to weaken the enemy so much that New York City would surely have to be abandoned unless substantial reinforcements arrived.

In his report, Duportail evaluated West Point's defenses by considering the several courses of action open to the British and the Continentals' possible responses to each. He concluded that the most probable approach for the enemy would be to gain control of the heights to the west above Fort Putnam and Webbs and Wyllys redoubts. And, Duportail declared, "we have assured the defense of this mountain, as much as it is necessary to do it." Hidden beneath his assertion was Duportail's hearty acceptance of works he originally opposed, works proposed and designed by Kosciuszko.

7. "HAPPILY, THE TIME FOR FEAR IS PASSED"

From Louis Duportail's review of British options at West Point.

August 20, 1779

To bar the river from the North in a suitable location is one thing the extreme importance of which everyone is presently aware. It is known that the depth of this river is considerable enough so that warships or frigates at least can go up it almost to Albany and that the breadth or the nature of its banks is such that enemy ships would find innumerable spots where in no manner would it be possible to damage them from the river bank. The enemy, by constant sailing of its frigates or small armed boats would prevent communication from the North to the south below Albany. Since the country above is still quite new sparsely populated and since there are few roads and besides the enemy, most of the river up to Albany, has the greatest facilities to reinforce and maintain the army of English, Tories and savages that he has within reach in these cantons, it follows that the passages above Albany would soon be in their possession, consequently, all comunication between the lands situated on one side of the river and those of the other would be completely broken; which would have very fatal consequences: the main ones are that all parts of the United States thus separated would be left to their own forces, without being able to call on any aid one from the other, which would weaken them considerably, against an enemy which can maneuver anywhere he desires. . . . When one reflects on that, one is surprised that the English have not turned their sights to that point, that they have not undertaken an operation so easy for a long time and so decisive. They could have done it up to the time of last May, for at that moment the works at West Point, even though I prepared them, and until then, there had never been enough troops to make up for the insufficiency of the works. Thus were we in a constant dilemma in regard to this valuable post. Happily, the time for fear is passed, and now far from being apprehensive about seeing the enemy march on this place, we infinitely desire it, assured that he would find there his ruin and his dishonor, and we an opportunity to weaken him so as to be unable to maintain himself any longer in New York, without receiving considerable reinforcements; this is what we are going to try to show by the following study:

In order to judge correctly the effect of the fortifications built at West Point, . . . it is appropriate to examine the different undertakings that the enemy can plan against this post; the different means by which he can proceed in his operations, as much by the land as by water, and what we can contrast with if from our side, we supposing West Point left to its own forces, that is defending itself with its garrison. . . .

[*Here Duportail considered four alternatives open to the British before reaching the following conclusion.*]

. . . It must . . . be admitted that the different undertakings that [I] have just . . . described lead only to breaking the chain in a hurry, without having time to carry it away nor to detach it from the woods in order to sink it. It is not probable that the enemy would expose himself to so much danger in order to cause a damage that can be easily repaired, if we prepare the means. I am inclined to believe that if he undertakes something against West Point it will be in a more solid and decisive way. This will be to make himself master following operations against all the forts of West Point either to hold them or to destroy them completely and thus procure for himself a free passageway on the river. . . .

Fifth Undertaking. The 5th Undertaking is the probable plan. If one examines the terrain above Fort Clinton, one will see that the heights which overlook it or which looks down on each other, are occupied rather extensively in two directions. On one side Putnam, Rockhill and [a redoubt]; from the other side Webbs, Willys, but also one sees a mountain which begins at Rockhill and which extends behind Putnam, Webbs and Willys and which perfectly dominates these works, so that this array of fortifications which prescribes a great deal at first look, is reduced to little for effect, because the enemy, supposedly in possession of this mountain can establish at the same time cannon and mortar batteries against Rockhill . . ., Putnam . . ., Webbs and Willys . . . these last two works are not even tenable for very long under these conditions, being too prolonged. It will be necessary then to abandon them early and consequently the enemy would advance along the slope . . . and can set up his batteries against Clinton without even having taken Fort Putnam. It is evident then that the real point of attack against West Point is from the mountain M,O[16] in question, since one comes all of a sudden from it to the attack on Putnam instead of making successive attacks on all the Forts above or below this Fort, as would be necessary coming from the other side. Now with respect to the difficulty to the enemy to get to this place, if there were no works, there would be none. This mountain is most accessible from any side and its slope from the west is such that cannon can easily be brought there, so that supposing the enemy, disembarked opposite Robinson's,[17] establishes himself on the mountain, sets up his batteries and fires his first cannon shot against Putnam, cannot require more than four or five days (since the batteries can be constructed even while the cannon are being brought up) it would be indispensable, then, to occupy this mountain; this is what we have done by the two works S,T. . . . I don't think it any longer possible for the enemy to select it as his debarkation point; it is true that from there to the first battery . . . is more than a mile; but one must consider that it is not a question of firing on a work, on a small space, but on a multitude of boats, ships, horses, carriages, men; everything conceivable assembled in one spot where all the apparatus of an army munitions of all types being unloaded. It is clear that at a distance of more than a mile each cannon round is almost sure and it must always strike something; that consequently one cannot select such a point to establish himself; moreover the enemy, getting off of his ships, will not expose himself by camping on the plain under the fire of these same batteries, he must then withdraw to the rear of this point. We can conclude that he will prefer to disembark at the other place . . . . This is already an advantage, to move further away the enemy's disembarkation point; this stretches still more his communications, gives greater facility to attacking him, renders more difficult the transportation of artillery and munitions.

Let us suppose now that the enemy established on the plain at the required distance and on the mountain (U) opposite our redoubts, what decision will he make then? Will this be to advance on our left under the fires of [two of our] batteries . . . and those that can be set up on the same mountain for the attack on the redoubt Willys, then on Webbs, from there to Putnam or Clinton? The absurdity of such a plan is too palpable for there to be a need to show its effect. The enemy can do only one of these two things. He can advance by the mountain . . . attack redoubt R in order to march against Rockhill, and from Rockhill against Putnam; but it must be noticed that redoubt R, can only be attacked in strength because it is perhaps impossible for the enemy to bring up large cannon against it as long as he does not control Redoubts S and T, secondly because it would be covered by [a] Battery . . ., against that which one might set up opposite . . . after having taken redoubt R by strong attack he must likewise take Rockhill and then Putnam for . . . the enemy cannot find (neither at the Redoubt R nor at Rockhill) cannon suitable for firing on the works.

The other route that the enemy can take to get to Putnam (which is still the central point to which he must come) is by the mountain . . . as we have already pointed out. He must then capture Redoubts S and T. If he captures only Redoubt T, he can easily establish his troops on the mountain, but he could only bring his cannon up there with an extraordinary, laborious and long toil, by the eastern slope; if he captures only Redoubt S he must bring his cannon along the Furnace [?] road, which can be regarded as almost impracticable, because it cannot be supposed in advance that he will bring his cannon through the valley under fire from Redoubts T and S and of their batteries. As to the difficulty itself of capturing the works, one can only set up batteries against them on the slope of the mountain opposite at more than 500 Toises,[18] too great a distance to destroy them with cannon. There will be, moreover, in each of these redoubts an underground bomb-proof shelter to protect the garrison. The enemy must then always come to an attack in force and they are in such condition that the undertaking would certainly be very dangerous.

It seems to me that we have assured the defense of this mountain, as much as it is necessary to do it, in view of the number of troops the enemy can sacrifice to the attack of West Point. . . .

Munitions. We have supposed up to the present the post of West Point left to its own forces, that is, defended by its own fortifications with their garrisons. We will say a word on how to use the additional troops that should be on hand when the enemy appears or who should come in the course of the attack. First, as we have said, the first posts to be occupied are the points of debarkation. Since we think that the enemy cannot come from King's Ferry by land, one might question that we do not advise stringing out troops in quantity on the roads and paths which lead from this area to West Point. Patrols only are necessary to warn that the fort at Montgomery not be surprised from the rear.

After that, the mountains opposite the redoubts R, S, T, being the first posts where the enemy must establish himself in order to push his operations against West Point, it is thus also one of the first that we must garrison. Some hundred men on these mountains making the approaches difficult by abatis will stop the enemy for a long time. We must reconnoiter, look for ways to attack them, to dislodge them. In areas of difficult access, covered with woods and rocks, this is quite long.

I will note here in passing that in a mountainous country if troops are placed on a mountain which has another one on its flank, . . . it is appropriate to put some men (as small a number as it might be) on this other mountain. This would prevent the enemy, who does not know their strength, from descending in the valley in order to turn the troops on the first mountain for fear of finding himself between two, or cut. There is place to apply this principle in the locations of which I am speaking here.

After occupying the mountains of which it was just a question, the location of the troops which we have more of as well as the natural retreat of those forward, if they were dislodged and on the mountain M, O, then they would place themselves in the rear of the abatis constructed between the redoubts S.T. and along the eastern and western slopes within range of defending these redoubts and to oppose themselves everywhere to the passage of the enemy. These troops, depending on their number, would construct in their rear, fortifications in the most favorable locations, leading to the type of works they can execute; in a word, they must use everything to defend this mountain for as long a time as possible for on it depends principally the defense of West Point, it cannot be repeated too much. . . .

—Manuscript Department, U.S. Military Academy Library. Translated by Lt. Col. Donald Dunne.

By fall 1779 plans for the West Point defensive complex were complete. With all sixteen enclosed positions either finished or under construction, only improvements and maintenance were required. Yet such work consumed considerable time. West Point now boasted a mutually supporting system of forts, redoubts, and batteries. Their combined effectiveness was required to achieve the primary goal—the closing of the Hudson to enemy vessels.

Duportail viewed West Point's scattered defenses with misgivings because they seemed to violate the dictates of the great French military engineer Marshal Sébastien le Prestre de Vauban. Yet while Vauban had stressed the use of single massive fortresses, he had also injected a note of flexibility by urging that defenses ought to utilize and augment the surrounding natural terrain. Although most of the foreign engineers in America had studied at the great French engineering school at Mézières where Vauban's theories were gospel, only Kosciuszko appears to have recognized Vauban's flexibility. The West Point system, historian Dave Richard Palmer has convincingly argued, was "a splendid prototype for the system of fortifications which were to be built in Europe in the next century."[19]

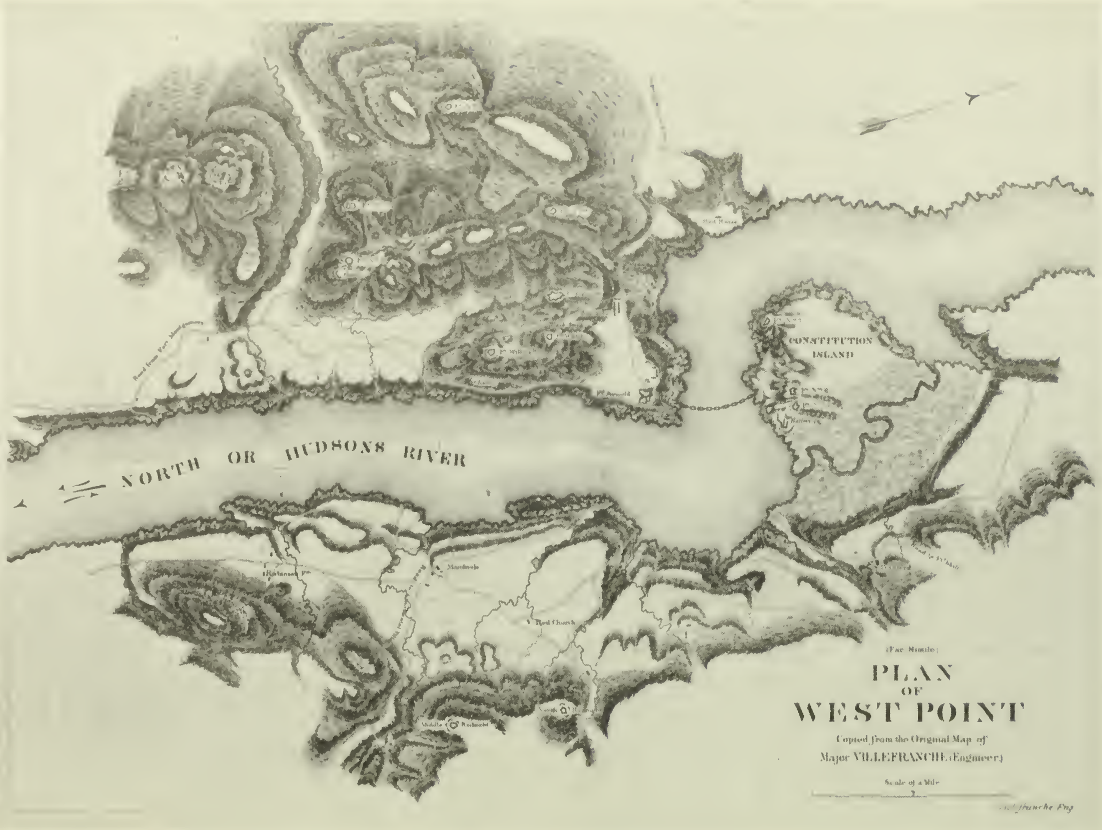
The enemy did not move against West Point that fall. After the British abandoned Stony and Verplanck's points, Gouvion led a large detachment of soldiers to level the enemy works at Verplanck's Point.[20] Little else happened in the Highlands throughout the harsh winter of 1779–80 except efforts to provide adequate barracks and customary repairs to the great chain. What little fortification Kosciuszko attempted was frustrated by a lack of artificers and laborers, a recurring problem at West Point.[21]

When Washington sent Duportail to help Maj. Gen. Benjamin Lincoln at Charleston, South Carolina, Gouvion left West Point to replace Duportail at headquarters. Another change occurred in August 1780 when Kosciuszko departed West Point to serve as an engineer in the south with General Gates. Maj. Jean Louis Ambroise de Genton, the Chevalier de Villefranche, succeeded Kosciuszko as West Point's engineer. A quick inspection of the point with Gouvion convinced Villefranche that improvements were needed.

Soon more than 400 men worked under Villefranche's direction, while a group of ten musicians eased the laborers' tasks with invigorating martial tunes. Although the newly formed companies of sappers and miners ought to have assisted Villefranche, evidence indicates that instead they were stationed with the artillery at Dobb's Ferry until the end of October, when they moved to West Point for the winter.

Unfortunately Villefranche also had to work with Maj. Gen. Benedict Arnold, commander at West Point since August 3. Already engaged in treason, Arnold outwardly supported Villefranche's plans but actually undermined his efforts by detaching sorely needed troops.[22] As construction and repairs lagged, the "Gibraltar of America" became weaker. Fortunately for the American cause, Arnold's treachery was discovered late in September, before he could deliver West Point into the hands of the enemy.

In late November the Chevalier de Chastellux, one of the Comte de Rochambeau's major generals, visited the Highlands during his travels



(Fac Simile)

PLAN
OF
WEST POINT

Copied from the Original Map of
Major VILLEFRANCHE (Engineer)

Scale of a Mile

...franche Eng

around America. His journals contain the following graphic description of the awesome Highlands setting and of the fortifications at West Point and Stony and Verplanck's points at a time when further combat operations in the north seemed unlikely. Revealing a Frenchman's bias, Chastellux attributed everything about the "beautiful and well-contrived works" to Duportail and Gouvion and did not even mention Kosciuszko's contributions.

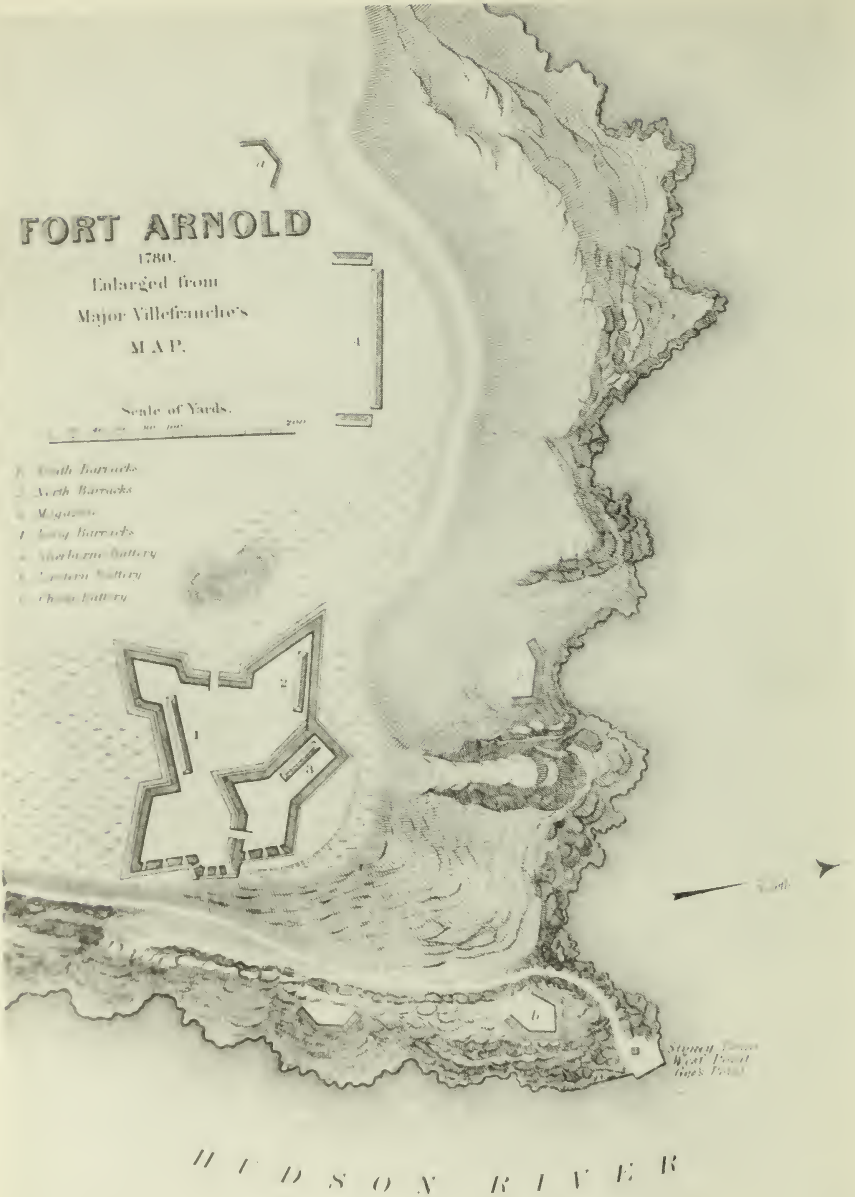
8. "THE MOST MAGNIFICENT PICTURE I HAVE EVER BEHELD"

From the journal of the Marquis de Chastellux.

November 21, 1780. . . . Descending slowly, at a turn of the road, my eyes were suddenly struck with the most magnificent picture I have ever beheld. It was a view of the North River [Hudson], running in a deep channel formed by the mountains, through which in former ages it had forced its passage. The fort of West Point and the formidable batteries which defend it, fix the attention on the western bank, but on lifting your eyes you behold on every side lofty summits, all bristling with redoubts and batteries. I leaped off my horse and stood there for a long time looking through my spyglass, the only method of acquiring a knowledge of the whole of the fortifications with which this important post is surrounded. Two lofty heights, on each of which a large redoubt is constructed, protect the eastern bank. These two works have no other name than the Northern and the Southern Redoubt; but from the fort of West Point proper, which is on the edge of the river, to the very top of the mountain at the foot of which it stands, are six different forts, all in the form of an amphitheater, and protecting each other. . . . General Heath . . . conducted me to the river, where his barge was waiting to take me across to the other side. As we were going down towards the river bank a new scene opened to my view, not less sublime than the former. We were facing towards the north: in that direction is an island covered with rocks, which seems to close the channel of the river, but you soon perceive, through a sort of embrasure which the river bed has formed by separating immense mountains, that it comes obliquely from the westward, and that it has made a sudden turn round West Point to open itself a passage and rush on to reach the sea,

WEST POINT FORTIFICATIONS. *This plan of the complete system of defenses at West Point was copied from the original map drawn in 1780 by the Chevalier de Villefranche. Villefranche (1747–84), a topographical engineer in France before coming to America in 1777, served in Pennsylvania and at West Point and Fort Herkimer in New York. He was one of the best mapmakers in the Corps of Engineers.*

Boynton, *History of West Point*



FORT ARNOLD. *This detailed sketch of West Point's main fort is enlarged from the plan made by Villefranche in 1780.*
Boynton, *History of West Point*

without hereafter making the smallest bend. The eye looking towards the north beyond Constitution Island (the island I have been speaking of) again perceives the river, discerns New Windsor on the western bank, and is then attracted by different amphitheaters formed by the Appalachian Mountains, whose nearest summits, terminating the scene, are more than ten leagues away. We embarked in the barge and crossed the river, which is nearly a mile wide. As we approached the opposite shore the fort of West Point which, seen from the eastern bank, had seemed humbly situated at the foot of the mountains, rose before our eyes and itself appeared like the summit of a steep rock; this rock however was only the bank of the river. Had I not remarked that the chinks on it, in several places, were embrasures for cannon and formidable batteries, I should soon have been apprised of this fact by thirteen 24-pounders, which were fired successively. This was a military salute, with which General Heath was pleased to honor me in the name of the thirteen states. Never was honor more imposing nor more majestic; every shot was, after a long interval, echoed back from the opposite bank with a noise nearly equal to that of the discharge itself. When we recollect that two years ago West Point was an almost inaccessible wilderness, which has since then been covered with fortresses and artillery, by a people, who six years before had scarcely ever seen cannon; when we reflect that the fate of the thirteen states has depended in great measure on this important post, and that a horse trader, transformed into a general, or rather become a hero, always intrepid, always victorious, but always purchasing victory at the price of his blood; that this extraordinary man, at once the honor and the opprobrium of his country, sold and expected to deliver this *Palladium* of American liberty to the English; when, indeed, so many wonders, of both the physical and moral order, are brought together, it may easily be imagined that I had sufficient food for thought, and that my mind was not idle on the road.

. . . Pressed by dinner time, we went immediately to General Heath's barrack. The fort, which was begun on much too extensive a plan, has since been compressed by M. Duportail, so that this barrack is no longer within its walls. Around it are some magazines, and farther to the northwest, barracks for three or four battalions; they are built of wood and similar to those at Fishkill. . . .

. . . As soon as we rose from table, we hurried to avail ourselves of the remaining daylight to examine the fortifications. The first fort we met with above West Point, on the declivity of the mountain, has been named for General Putnam. It is placed on a rock very steep on every side; the ramparts were at first constructed with trunks of trees; they are being rebuilt of stone and are not yet entirely finished. There is a bombproof powder magazine, a large cistern, and a souterrain for the garrison. Above this fort, and on reaching the highest peak, you can still see, on three other summits, three strong redoubts lined with cannon, each of which would

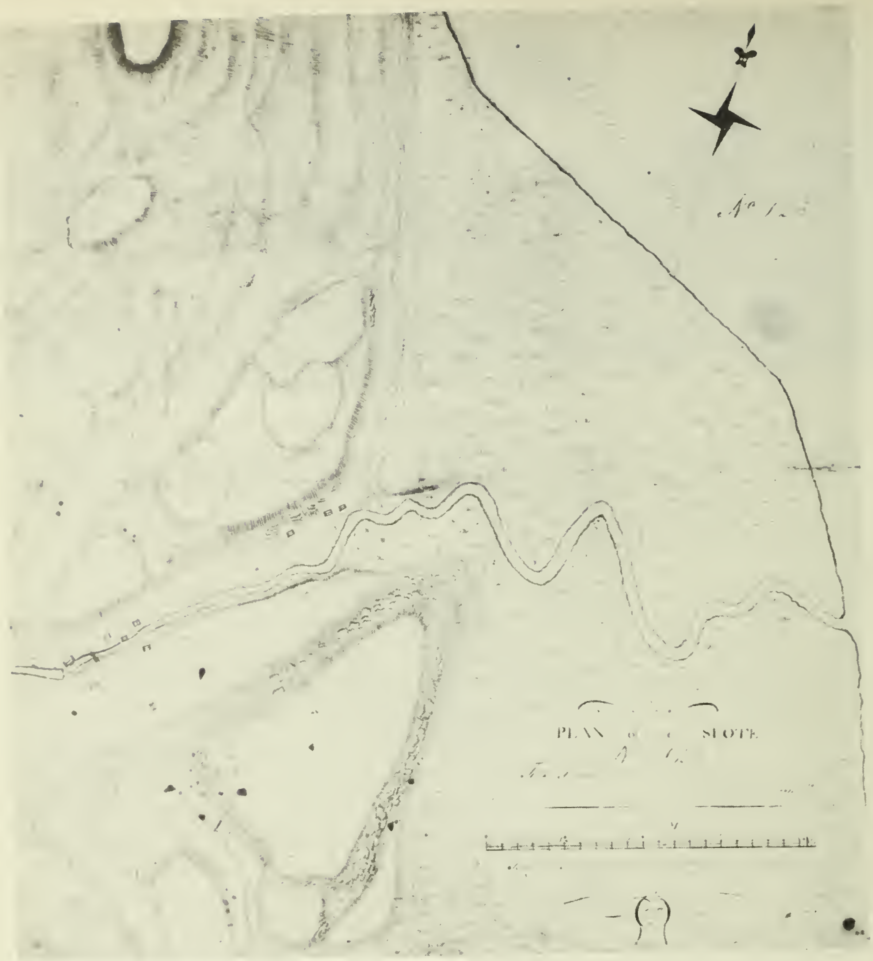
WEST POINT PANORAMA. *This view of West Point from the east side of the Hudson is from a watercolor by Pierre Charles L'Enfant, an officer in the Corps of Engineers.*
Record Group 66, National Archives

require a formal siege. The day being nearly spent, I contented myself with judging by the eye of the very intelligent manner in which they are calculated for mutual protection. Fort "Wallis" [Wyllys], whither General Heath conducted me, was nearer and more accessible. Though it is placed lower than Fort Putnam, it still commands the river to the south. It is a large pentagonal redoubt, built of huge tree trunks; it is picketed (*fraisé*) and lined with artillery. Under the fire of this redoubt, and lower down, is a battery of cannon to range more obliquely the course of the river. This battery is not closed at the gorge, so that the enemy may take it, but never keep it; which leads me to remark that this is the best method to follow in all field fortifications. Batteries placed in works have two inconveniences: the first is that if these works be ever so little elevated, they do not graze sufficiently; and the second, that the enemy may at the same time attack the redoubt and the battery: whereas if the battery is exterior and protected by the redoubt, it must be attacked first; in which case it is supported by troops who have nothing to fear for themselves, and whose fire is consequently better directed and more deadly. A battery still lower down and nearer to the river completes the security of the southern part.

While returning to West Point we saw a redoubt that has been allowed to go to ruin, as being useless, which in fact it is. It was dark when we got home, but what I still had to observe did not require daylight. This was a vast souterrain, formed within the fort of West Point [Fort Clinton], where not only the powder and ammunition necessary for this post are kept in reserve, but also the depot for the whole army. These magazines neatly filled, the numerous artillery one sees in these different fortresses, the prodigious labor necessary to transport and pile up on steep rocks, huge trunks of trees and enormous hewn stones, impress the mind with an idea

of the Americans very different from that which the English ministry have labored to give to Parliament. A Frenchman would be surprised that a nation, just rising into notice, should have expended in two years upwards of twelve millions *livres* in this wilderness. He would be still more so on learning that these fortifications cost nothing to the state, having been built by soldiers, who received not the smallest gratification and who did not even receive their stated pay; but he would doubtless feel some satisfaction upon hearing that these beautiful and well-contrived works were planned and executed by two French engineers, M. Duportail and M. de Gouvion, who received no more pay than their workmen. . . .

November 22, 1780. General Heath, who was detained by business at West Point, sent Major Lyman to accompany me to Verplanck's Point, where we did not arrive till half past twelve, after a continuous journey amidst the immense mountains which cover this country and through which the bed of the river is the only passage. . . . M. de Gouvion constructed a redoubt at Verplanck's Point [nearly opposite, on the eastern bank], where we now landed, and where, by a lucky accident, we found our horses, which arrived at the same time we did. This redoubt is of a peculiar form, hardly ever used in America: the ditch is within the parapet, which is made steep on both sides, and picketed (*fraisé*) at the level of the cordon; lodgings for the soldiers are formed below. The middle of the work is a *reduit* constructed of wood, and in the form of a square tower. It has battlements everywhere and commands the rampart. An abatis formed of interwoven tops of trees surrounds the whole and is a substitute for a covered way. We may easily perceive that such a work cannot be surprised, nor taken without cannon. Now as this is backed by the mountains, of which the Americans are still masters, it is almost impossible that the English should besiege it. A ''creek'' which flows into the Hudson river, and runs to the southward of this redoubt, renders its position still more advantageous. Colonel [James] Livingston, who commands at King's Ferry, has established himself there in preference to Stony Point, to be nearer White Plains, where the English frequently make incursions. . . .



THE SLOTE. *As part of the Army's attempt to map crucial terrain, Captain William McMurray of the sappers and miners drew this plan in September 1780. The map details the major road connecting New Windsor with the rebel encampments in northern New Jersey as it passes through Smith's Clove, also known as the Slote. It is the only map known to have been executed for the geographer's department by an officer of the sappers and miners.*

New-York Historical Society, New York City

About two o'clock we crossed the river, and stopped to examine the fortifications of Stony Point. The Americans finding them too extensive, have reduced them to a redoubt, nearly similar to that of Verplanck's, but not quite so good. There I took leave of Mr. Livingston, who gave me a guide to conduct me to the army, and I set off. . . . On leaving the river, I frequently turned round to enjoy the magnificent spectacle it presents in this place, where its bed becomes so large, that in viewing it to the southward, it has the appearance of an immense lake, whilst the northern aspect is that of a majestic river.

—Chastellux, *Travels in North America*, 1:89–91, 93–94, 96–98. *Copyright 1963 by the University of North Carolina Press. Published for the Institute of Early American History and Culture. By permission of the publisher.*

By the end of 1780 the British still had not attempted a direct assault on West Point, nor were they to do so for the remainder of the war. In 1781 the Americans concentrated first on turning the British out of New York City and then on the final strategy against Lord Cornwallis in Virginia that culminated with the siege of Yorktown. With attention focused elsewhere, the works at West Point were allowed to deteriorate.

Circumstances changed considerably after the American victory at Yorktown, because Washington stationed the bulk of his Army in the Highlands. Thus General Heath, the commander, and Villefranche, his engineer, planned a hospital and other buildings to house the Army, its equipment, and supplies.

In spring 1782 Washington returned to West Point and found conditions unacceptable. With both Duportail and Gouvion on leave in France, he ordered Villefranche to prepare a full report on the requirements for housing and protecting the Army. Throughout the war there had always seemed to be plenty of work to keep the Army's engineers, artisans, and fatigue men busy; in Villefranche's view, 1782 was no different. Washington responded to the engineer's numerous requests by ordering the repairs.

9. VILLEFRANCHE'S REPORT ON THE WORK REQUIRED AT WEST POINT

West Point, 15 April 1782

To Complete the several Redoubts and batteries at this post.

Fort Clinton. The fascines which Constitute that work are so very dry that the least sparks of fire is sufficient to set the fort in a blaze; i think therfore that those old fascines aught to be taken away entirely and timber put in the place of them, or good masonry.

The Counterscarp must also be secured, and the Coverd way Continued all round the fort and aught to be palissadoed.

A new Bomb proof should be built as large as the Tereplain will admit.

The half bastion of the old fort which faces the river ought to be finished and a battery establish[ed] upon it, to Command the plain and defend the river. This half bastion to be joind to the new fort by a branche.

The old fort aught to be demolished quite to the powder magazine.

A barbet Battery is to be Constructed under the protection of the fort for the defense of the Chain.

Fort Putnam. Half of the fort which is built with dry stone wall, ought to be rebuilt in good Masonry. A new Magazine for powder, and barracks sufficient to quarter the troops of the garrison should be Built; the Cistern must be finished. . . .

Fort Willys. The bomb proof should be Coverd with two feet of earth. The inside of the parapet is to be raised a little, so as to make it four feet four inches higher than the Banquet.

The south part of the wall must be rebuilt. The battery must be joind to the fort by two branches of palissadoes.

Fort No. 1. There must be a bomb proof, a Magazine for powder, one for provisions, and Barracks for the Garrison. The two batteries are Compleate.

Fort No. 2. There must be a bomb proof, a Magazine for powder, one for provisions, and Barracks for the garrison: three quarters of the Battery only is don therefore aught to be finished.

Fort No.3. There ought to be a bomb proof, a Magazine for powder, one for provisions, and Barraks for the Garrison.

The battery newly began, must be finished and an other established to defend the Valley towards the north.

Fort No. 4. The new breast work, a quarter part of which is don must be finished, a powder Magazine one for provisions, and barraks for the garrison, must be built;

There ought also a battery to be Constructed north of the fort.

There must be a Block house Built between No. 3 and 4.

Constitution Island, Fort No. 5 and 6. Palissadoes are to be erected upon the parapets, bomb proofs Magazines for powder, and provisions, and Barracks for the garisons, should be Constructed and Batteries erected under the protection of the forts, for the defence of the back part of the Island, and abatis put all round the forts.

[Constitution Island,] Fort No. 7. A bomb proof, a Magazine for powder, one for provisions, and Barracks for the Garison are to be Built, and a battery is to be erected under the protection of the fort to defend the Back part of the Island; abatis are to be put alround the fort.

There is a battery begun for the defence of the chain which ought to be finished.

On the east side of the river, the north and south redoubt with ther Batteries are Complited. . . .

To put this post in a state of defence, together with an estimate of the materials requisite.

I don't think the embrasures in this fort, in there present situation, will beare the exercise of Cannon without the greatest danger of seting the whole on fire; it will therefore be necessary to pull down the fascines with which the faces of the embrasures are constructed and to built them with timber. The necessary articles to make the reparation are the following: 24 pieces of timber 10 feet in lenght [*sic*] and 8 by 8; 12 pieces of timber 13 feet in lenght and 8 by 8; 12 pieces of timber 18 feet in lenght and 8 by 8; 108 four inch plank. 8 Carpenters and 16 fatigue men will accomplish it in 15 days.

As the Bomb proof in Fort Clinton is half filled up with powders, the fascines with which it is surrounded should be replaced by a dry stone wall. The requisite assistance to accomplish it in 15 days are three teams 8 Masons, six miners, 60 fatigue men, and 30 hand barrows. . . .

The Courtin which Covers the powder Magazine is not defended, and is a shelter for the enemy to Come to the foot of the magazine; i think it would be proper to profit of the bastion which flanks that Courtin, and to make a redoubt with it; the gorge of which should be left open. A block house could be erected in the tereplain of the said redoubt, which would answer both to augment the defence, and Barrack the troops. A powder Magazine could also be Constructed under the block house; if your excellency thinks proper to have that redoubt erected, i shal give an estimate of the materials.

Fort Putnam. The powder Magazine is not secure against the shells. Consequently a wall should be built allround it.

That part of the fort which faces the river is very easy to be storm'd, a little breast work erected on the top of the parapet would add greatly to its defence, the assistance requisite to Complete these two works in 15 days are 12 Masons, 8 Miners, 150 fatigue men, 40 . . . hand barrows. . . . [Villefranche continued his report listing in a similar fashion the men, materials, and equipment required to improve West Point's fortifications.]

—Washington Papers, roll 84.

For a brief period in May Villefranche's attention turned to a more frivolous concern, the celebration of the birth of an heir to the French king, Louis XVI. In a passage from his journal, army surgeon James Thacher described the grand festivities at West Point and Villefranche's ingenious contributions to them. The revelry infused a new spirit into the war-weary troops.

10. VILLEFRANCHE'S "SUPERB STRUCTURE . . . AFFECTED THE SPECTATORS WITH ADMIRATION AND PLEASURE"

From James Thacher's journal.

June 1st [1782]—Yesterday was celebrated the birth of the Dauphin of France [the eldest son of Louis XVI], by a magnificent festival. The edifice under which the company assembled and partook of the entertainment, was erected on the plain at West Point. The situation was romantic, and the occasion novel and interesting. Major Villefranche, an ingenious French engineer, has been employed with one thousand men about ten days, in constructing the curious edifice. It is composed of the simple materials which the common trees in this vicinity afford. It is about six hundred feet in length and thirty feet wide, supported by a grand colonnade of one hundred and eighteen pillars, made of the trunks of trees. The covering of the roof consists of boughs, or branches of trees curiously interwoven, and the same materials form the walls, leaving the ends entirely open. On the inside, every pillar was encircled with muskets and bayonets bound round in a fanciful and handsome manner, and the whole interior was decorated with evergreens, with American and French military colors, and a variety of emblems and devices, all adjusted in such style as to beautify the whole interior of the fabric. This superb structure, in symmetry of proportion, neatness of workmanship, and elegance of arrangement, has seldom perhaps been surpassed on any temporary occasion; it affected the spectators with admiration and pleasure, and reflects much credit on the taste and ability of Major Villefranche. Several appropriate mottos decorated the grand edifice, pronouncing benedictions on the Dauphin and happiness to the two allied nations. The whole army was paraded on the contiguous hills on both sides of the river, forming a circle of several miles in open view of the public edifice, and at the given signal of firing three cannon, the regimental officers all left their commands and repaired to the building to partake of the entertainment which had been prepared by order of the Commander in Chief. At five o'clock, dinner being on the table, his Excellency General Washington, and his lady and suite, the principal officers of the army and their ladies, Governor [George] Clinton and his lady, and a number of respectable characters from the states of New York and New Jersey, moved from Major General McDougall's quarters through the line formed by Colonel Crain's regiment of artillery, to the arbor, where more than five hundred gentlemen and ladies partook of a magnificent festival. A martial band charmed our senses with music, while we feasted our appetites and gazed with admiration on the illustrious guests, and the novel spectacle exhibited to our view. The cloth being removed, thirteen appropriate toasts were drank, each one being announced by the discharge of thirteen cannon and accompanied by music. The guests retired from the table at seven o'clock, and the regimental officers repaired to their respective commands. The arbor was, in the evening, illuminated by a vast number of lights, which being arranged in regular and tasteful order, exhibited a scene vieing in brilliancy with the starry firmament. The officers having rejoined their regiments, thirteen cannon were again fired as a prelude to a general feu de joie, which immediately succeeded throughout the whole line of the army on the surrounding hills, and being three times repeated, the mountains resounded and echoed like tremendous peals of thunder, and the flashing from thousands of fire arms in the darkness of evening, could be compared only to the most vivid flashes of lightning from the clouds. The feu de joie was immediately followed by three shouts of acclamation and benediction for the *Dauphin*, by the united voices of the whole army on all sides. At half past eleven o'clock, the celebration was concluded by the exhibition of fire works very ingeniously constructed of various figures. His Excellency General Washington was unusually cheerful. He attended the ball in the evening and with a dignified and graceful air, having Mrs. Knox for his partner, carried down a dance of twenty couple in the arbor on the green grass.

**—Thacher, *Military Journal*,
pp. 372–74.**

In July 1782 the Board of War designated West Point a powder depository. Washington favored a site on the west side of the Hudson for the powder magazine, but Villefranche disagreed. The engineer got his way, and a magazine was built on Constitution Island according to the principles of Vauban.

By the end of the summer West Point had a new commander, Henry Knox, the chief of artillery; and members of the sappers and miners corps had returned to West Point from duty in the south. These engineer troops immediately began blasting rock for use in repairing the works on Constitution Island. "Our duty was not hard," a sergeant in the corps recalled, "but the engineers kept us busy."[23] The sappers and miners also built "elegant" new two-story barracks, which, before the new year, they moved into, along with part of an artillery regiment and the Corps of Invalids.

After Yorktown the British still held New York City, but no one thought West Point was threatened. The sappers and miners' detail was reduced to the routine tasks of cutting firewood and standing guard duty, which in some cases they shared with the invalid corps.[24]

In these waning months of the war, life in the Highlands was often boring and seldom comfortable. Discipline problems began to plague the sappers and miners. As related with typical cleverness by Joseph Plumb Martin in the first of the following documents, several incidents, including a plan to "blow up" David Bushnell, revealed how unpopular the captain was with the non-commissioned officers and enlisted men.

11. "I VERILY BELIEVE, I SAVED THE OLD MAN'S LIFE"

From the narrative of Joseph Plumb Martin.

In the month of September [1782], while we lay here [Constitution Island] and our tents were pitched about promiscuously, by reason of the ruggedness of the ground, our captain [David Bushnell] had pitched his marquee in an old gravel pit, at some distance from the tents of the men. One day, two or three of our young hotheads told me that they and some others of the men, whom they mentioned, were about to have some fun with "the old man," as they generally called the captain. I inquired what their plans were, and they informed me that they had put some powder into a canteen and were going to give him a bit of a hoist. I asked them to let me see their apparatus before they put their project in execution. Accordingly, they soon after showed me a wooden canteen with more, as I judged, than three pounds of gunpowder in it, with a stopper of touchwood for a fuse affixed to it, all, they said, in prime order. I told them they were crazy, that the powder they had in the canteen would "hoist" him out of time, but they insisted upon proceeding. It would only frighten him, they said, and that was all they wished to do—it would make him a little more complaisant. I then told them that if they persisted in their determination and would not promise me on the spot to give up their scheme, I would that instant go to the captain and lay the whole affair before him. At length, after endeavoring without effect to obtain my consent to try a little under his berth, they concluded to give up the affair altogether, and thus, I verily believe, I saved the old man's life, although I do not think that they meant anything more than to frighten him. But the men hated him and did not much care what happened to him.

There was the foundation of some barracks which the British had burnt in their excursion up the North River in the year 1777; it was composed of stone and lime, perfectly level and, perhaps, a hundred feet long. The bushes had grown up around it, excepting the side next the river; the place formed a very pretty spot for a contemplative evening's walk. The captain used frequently, in fine weather, to be seen pacing backward and forward upon this wall, between sunset and dark. The men observed him and itched to discommode him but, since they had made me privy to their roguery, they dare not play any of their tricks upon him without consulting me for fear of being discovered. They therefore applied to me for my consent to "cut some caper" with him, as they called it. Their plan now was to set an old musket, which they had somewhere obtained, in the manner that hunters set them to kill wild animals, charged only with powder. I consented to let them try this experiment, but, after all, it never took effect. Either the captain discovered it or it failed by accident or from some other cause, for I never heard anything more about it. I did not wish him to receive any personal injury from their roguery, but I cared very little how much they frightened him. I did not consider myself as being under very heavy obligations to him for his civilities to me, and many of the men considered themselves under still less.

One young man, who was the ringleader of this "gunpowder plot," had a particular grudge against the old man, which urged him on to devise mischief against him. I imagine that he considered himself justified by his conscience in doing so, in consequence of several affronts, as he termed them, which he had received from him. I will mention one or two to which I was knowing, that the reader may be able to form some judgment as to the cause he had to be revenged on the poor old captain.

He once purloined a flour barrel, I think, from the baker, for the purpose of making a washing tub. The pretended owner complained to the captain, who, apparently, took no notice of it at the time. However, as it appeared not long afterwards, he did not forget it, for this man, one morning soon after, went off without leave with some others, who had permission, across the mountain to New Windsor, eight or ten miles distant, and did not return till after evening roll call, at which time he was reported as absent without leave. The sergeant major (who belonged to our company) chanced that evening to call the roll. He was a sheer sycophant and would, at any time, have a man punished if he could by so doing ingratiate himself with the officers. He therefore, as might be expected, informed the captain of the whole affair. The captain ordered the sergeant major to send the delinquent to him as soon as he returned, which he accordingly did. The captain used but very little reasoning with him before be began to use harder arguments than words could convey, urged by the weight of his rattan. After he had satiated his vengeance upon the poor culprit for playing the truant, he told him that the flour barrel was still to settle for, and then paid him for that, principal and interest.

Another affair, in which the captain and he differed in opinion, happened while we were lying at West Point. It was as follows. This man used sometimes to attend on the sergeants' mess, as they were allowed a waiter or cook. He acted as such at the time I mention. One morning after roll call, we (the sergeants) allowed him, at his own request, to go and work for a farmer in the neighborhood of the camp. He had done so before, and it was quite agreeable to us all, for he received his wages for his work in milk, butter, etc., which he always brought into the mess. On the day mentioned, he was at work at the farmer's pulling flax. The farmer had an orchard close by where our man was at work. The soldiers, as they passed, used often to pillage some of the good man's apples. To prevent these depredations upon his property, in some measure, he requested our soldier to take an old musket belonging to the house, loaded with powder only, and when any . . . plunderers passed by, to pretend that he was a sentinel and drive them off. Not content with going thus far, he must put a small plighted apple into his musket for a ball. It was not long before he had an opportunity to exercise his sentryship, for several soldiers coming by and taking the liberty, as usual, to take some fruit, they were ordered off by our hero, and not obeying as soon as he desired, or expected, he fired his apple amongst them, which did not seem to be very agreeable to their feelings. They knew to what corps he belonged by his uniform, and ours was the first they came to on entering the garrison. As the poor fellow's ill luck would have it, the sergeant major was the first they encountered upon entering. They made bitter complaint against the pretended sentry, and he carried it directly to the captain, without losing a morsel by the way. The captain ordered him to send the man to him as soon as he came home. The captain's marquee had a shade over and round the entrance. I was upon quarters guard at a tent in the rear of the captain's when, just after roll call, I saw poor Pilgarlick repairing to the captain's tent. I pretty well knew what would be the consequence of his visit. I listened, heard some discourse between them, but the distance was so great that I could hear but little distinctly, but I soon heard the rattan in motion again, very plainly. As soon as the action was over, the man came to me at the guard. I asked him what the captain and he had been at, as they had, to appearance, been very lively. "I will tell you," said he, "the sergeant major had told the captain that I had deserted, but when he found I had not, he sent for me to come and see him, and you cannot conceive how glad he was to see me, and nothing would do but I must dance a jig with him. I told him I had much rather not, as, possibly, it might injure his character to be seen dancing with a private soldier. But it would not signify, a jig we must have at all events, and he got hold of my hand and began to whistle and I began to dance, and a fine jig I suppose he thought we had. The plague seize his old carcass, I wish he was *twisted* up fifteen miles above the seven stars, there to remain till every hair of his head was a meteor and every limb a comet." I could not help laughing at his buffoonery, though I thought if I had been in his place I should not have turned it off so lightly.

—Martin, *Private Yankee Doodle,* pp. 262–67.

A court-martial in 1783, involving two officers charged with disobeying Bushnell's orders, demonstrated further that tension was rife within the companies of sappers and miners.

12. "THE BLOT WHICH NOW STAINS A PAGE IN THE RECORDS OF THE ARMY"

From George Washington's general orders.

Thursday, February 13, 1783

. . . The Court after maturely considering the evidences for and against Captn. Lieut. [Peter] Taulman and his Defence are of opinion that he did not make out a provision return agreably to a form sent him for that purpose Decr. the 31st. 1782, by Captain Bushnell his Commanding officer, and also that he did order his Baggage into Captn. Bushnells quarters the first of January last contrary to Captain Bushnells command to him, and refused to take it away agreably to Captn. Bushnell's express orders in breach of the latter part of art. 5 section 2d. of the rules and articles of war, the Court are also of opinion that Captain Lieutenant Taulmans answer to Captn. Bushnells order to him of the 31st. December 1782 is indecent and impertinent and unbecoming the Character of an Officer in breach of articles the 5th section 18th. of the Rules and articles of war. On the third charge the Court are of opinion that Captain Lieutenant Taulman did order soldiers to disobey the express orders of Captain Bushnell on the 1st. of January, in such a manner however as not to amount to mutinous behavior, but which does amount to very disorderly behavior in breach of Article 5th. section 18th. of the rules and articles of war.

The court sentence Captain Lt. Taulman to be repremanded in Genl. orders, and be suspended from service for three months.

. . . The court after maturely considering the evidences for and against Captain Lieutt. [David] Kirkpatrick and his defence are of opinion that Captain Lt. Kirkpatrick did on the first of January order soldiers to disobey the express orders of Captain Bushnell his commanding officer, and also that he did order his baggage into Captain Bushnells Quarters contrary to Captain Bushnells command to him, and refused to take it away agreably to Captn Bushnells express orders to him. The court acquit Captn. Lieutenant Kirkpatrick of mutinous behavior but find him quilty of disobedience of orders in breach of a part of article 5th. section 2d. of the rules and articles of war and sentence him to be repremanded in general orders.

The Commander in chief approves the foregoing sentences.

Had the transaction's which are the subject of reprehension taken place at the commencement of our military establishment, want of experience, ignorance of the rules of service or someother palliating circumstance might have been plead in excuse; and would in some degree have effaced the blot which now stains a page in the Records of the Army; but at this period of the war, when the necessity of subordination, and the principles of service are generally well understood, and practiced, Captn. Lieutt. Taulman and Captn. Lt. Kirkpatrick could not but have known, that the improper Conduct, willful disobedience of Orders they have been guilty of were an outrageous infraction of military Decipline: and the behavior of Captain Lieutenant Taulman (that officer must be sensible) would have justified a more rigorous and exemplary sentence; with this consciousness to attend them, the Commander in Chief leaves the young Gentlemen to the sting of their own reflections as a punishment for what is past, and only advises them not to be guilty of any thing of a similar nature in the future.

—Fitzpatrick, *Writings of Washington,* 26:130–32.

In April 1783 Congress declared hostilities at an end, but the peace treaty was not signed until September. On June 11 the Corps of Engineers and its companies of sappers and miners finally disbanded by order of Congress. In a passage from his memoirs, Sergeant Martin recalled the occasion with considerable sadness. The soldiers had formed "as strict a band of brotherhood as Masons," he wrote, "and now we were to be . . . separated as though the grave lay between us."

13. "WE HAD LIVED TOGETHER AS A FAMILY OF BROTHERS"

From the narrative of Joseph Plumb Martin.

At length the eleventh day of June, 1783, arrived. "The old man," our captain [David Bushnell] came into our room, with his hands full of papers, and first ordered us to empty all our cartridge boxes upon the floor (this was the last order he ever gave us) and then told us that if we needed them we might take some of them again. They were all immediately gathered up and returned to our boxes. Government had given us our arms and we considered the ammunition as belonging to them, and he had neither right nor orders to take them from us. He then handed us our discharges, or rather furloughs, for they were in appearance no other than furloughs, permission to return home, but to return to the army again if required. This was policy in government; to discharge us absolutely in our present pitiful, forlorn condition, it was feared, might cause some difficulties which might be too hard for government to get easily over.

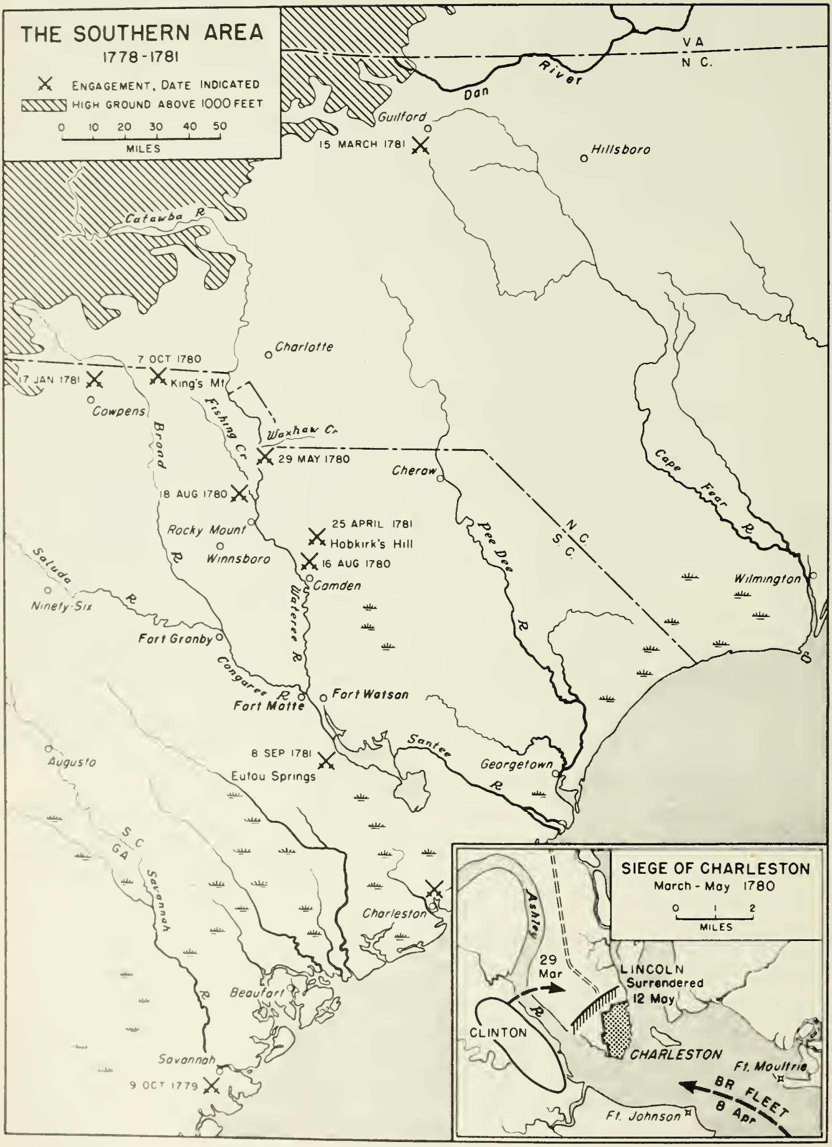
The powder in our cartridges was soon burnt. Some saluted the officers with large charges; others only squibbed them, just as each one's mind was affected toward them. Our "old man" had a number of these last-mentioned symbols of honor and affection presented him. Some of the men were not half so liberal in the use of powder as they were when they would have given him a canteenful at once.

I confess, after all, that my anticipation of the happiness I should experience upon such a day as this was not realized; I can assure the reader that there was as much sorrow as joy transfused on the occasion. We had lived together as a family of brothers for several years, setting aside some little family squabbles, like most other families, had shared with each other the hardships, dangers, and sufferings incident to a soldier's life; had sympathized with each other in trouble and sickness; had assisted in bearing each other's burdens or strove to make them lighter by council and advice; had endeavored to conceal each other's faults or make them appear in as good a light as they would bear. In short, the soldiers, each in his particular circle of acquaintance, were as strict a band of brotherhood as Masons and, I believe, as faithful to each other. And now we were to be, the greater part of us, parted forever; as unconditionally separated as though the grave lay between us. This, I say, was the case with the most, I will not say all; there were as many genuine misanthropists among the soldiers, according to numbers, as of any other class of people whatever, and some in our corps of Miners, but we were young men and had warm hearts. I question if there was a corps in the army that parted with more regret than ours did, the New Englanders in particular. Ah! it was a serious time.

Some of the soldiers went off for home the same day that their fetters were knocked off; others stayed and got their final settlement certificates, which they sold to procure decent clothing and money sufficient to enable them to pass with decency through the country and to appear something like themselves when they arrived among their friends. I was among those; I went up the river to the Wallkill and stayed some time.

—Martin, *Private Yankee Doodle,* pp. 279–81.

The American grasp on West Point effectively neutralized enemy occupied New York City. And the Point's defenses very likely deterred the British from a full-scale attempt to gain control of the Highlands. Clearly Army engineers contributed substantially to the patriot success in holding the Highlands. Overall the experience at West Point provided a strong argument in favor of a professional army—including a corps of engineers—in the future.


THE SOUTHERN AREA
1778-1781
ENGAGEMENT, DATE INDICATED
HIGH GROUND ABOVE 1000 FEET
0 10 20 30 40 50
MILES
VA
N C.
Dan
River
Guilford
15 MARCH 1781
Hillsboro
Catawba R
Charlotte
7 OCT 1780
17 JAN 1781
King's Mt
Cowpens
Broad
Fishing Cr
Waxhaw Cr
29 MAY 1780
Cherow
18 AUG 1780
Rocky Mount
25 APRIL 1781
Hobkirk's Hill
16 AUG 1780
Winnsboro
Camden
Saluda
R
Ninety-Six
R
Wateree R
Fort Granby
Congaree R
Fort Motte
Fort Watson
Pee Dee
R
N C.
S. C.
Cape
Fear
R
Wilmington
Santee
R
Georgetown
8 SEP 1781
Eutou Springs
Augusta
S C
GA
Savannah
R
Charleston
Beaufort
Savannah
9 OCT 1779
SIEGE OF CHARLESTON
March - May 1780
0 1 2
MILES
Ashley
R
29
Mar
LINCOLN
Surrendered
12 May
CLINTON
CHARLESTON
Ft. Moultrie
BR FLEET
8 Apr
Ft. Johnson

Chapter VIII

THE CAMPAIGN IN THE SOUTH: VIRGINIA, THE CAROLINAS, AND GEORGIA, 1776–1782

On 29 March 1776 Maj. Gen. Charles Lee arrived in Williamsburg, Virginia, to assume command of the Continental Army's newly created Southern Department, whose theater of operations comprised Virginia, the Carolinas, and Georgia. Only a few weeks earlier Lee had been in New York directing an ambitious rebel effort to secure that city's defenses. Now he was far away in the new theater where the enemy threatened a major offensive to restore royal authority. Lord Dunmore, Virginia's last royal governor, was poised menacingly on Gwynn Island near the mouth of the Rappahannock River, where he had taken refuge after burning Norfolk in January 1776.

As an experienced officer Lee astutely recognized the dangers presented by the southern states' extensive navigable waterways, which allowed the enemy, as he put it, "with canvas wings" to "fly from one spot to another."[1] Accordingly, Lee suggested that Virginia adopt measures to secure her rivers from enemy depredations. He recommended building armed gallies and floating or fixed batteries, and placing gunproof mantlets along the shoreline.[2]

Achieving an adequate state of defense would not be easy: artificers and carpenters were generally unmotivated and engineers in too short supply. As a consequence Lee urged that companies of carpenters, blacksmiths, and artificers be established, and he pleaded with Washington for assistance. "Had we arms for the minute men and half a dozen good field Engineers, we might laugh at . . . [the enemy's] efforts," Lee protested, "but in this article (like the rest of the Continent) we are miserably deficient."[3]

Lee did have two engineers, Baron Massenbach and John Stadler, assigned to his department. Having been advised by Virginia and North Carolina delegates in Congress that "there was not a single field engineer in their Provinces," Lee, in Baltimore on his way to Virginia, had personally recruited Massenbach.[4] As for Stadler, Virginia had employed him earlier. Hardly a month after his arrival in the south Lee justifiably worried that

SOUTHERN THEATER OF WAR. *This modern map locates engagements in the South in the period 1778–81.*
U.S. Army Center of Military History

both engineers would resign their commissions because they received a "wretched pittance" equal to that of "common carpenters or bricklayers."[5] Also, Lee got no cooperation on his request to Congress to send him Capt. William Smith, who had served him as an engineer in New York City.

With a greater enemy assault threatening in the Carolinas, Lee left Virginia before mid-May. Stadler stayed behind with Brig. Gen. Andrew Lewis and erected shore works facing Dunmore's Gwynn Island stronghold. Dunmore remained there until a rebel assault led by Lewis and supported by fire from Stadler's fortifications drove him out on July 9.

On 1 June 1776 the British fleet, carrying more than three thousand troops commanded by Sir Henry Clinton and Lord Cornwallis, appeared near the islands off Charleston, South Carolina. Lee rushed there, arriving on the 4th with little time to spare in readying the city's defenses.

Fortunately South Carolinians had recognized the potential danger and had taken steps earlier to protect their fine seaport from attack. In January 1776 local authorities led by John Rutledge, president of the South Carolina General Assembly, had planned a new fort—a square redoubt with bastioned corners—to be erected on low-lying, sandy Sullivan's Island, several miles below Charleston. The rebels hoped that enemy ships would never sail past that point or nearby James Island, where large guns were mounted. Although they threw up some breastworks immediately surrounding the city, they concentrated their effort on Sullivan's Island.

Beginning in March Col. William Moultrie of the 2d South Carolina Regiment had overseen the construction on Sullivan's Island. Faced with a shortage of laborers, Moultrie utilized large numbers of black slaves and mechanics. The workers cut logs from the soft wood of locally flourishing palmetto trees, a variety of palm. They placed the logs in parallel lines sixteen feet apart and filled the intervening space with sand. While wooden walls were generally inferior to stone walls, the resilience of palmetto wood made it considerably better than hard wood for resisting cannonfire.

When Lee arrived the American defenses on Sullivan's Island were far from complete, but once again enemy delays and adverse weather conditions gave the Americans precious time to improve their position. Despite grave misgivings about Fort Sullivan, Lee boldly took charge of the Charleston defenses. His presence lifted the townspeople's spirits. But "Courage alone will not suffice in war," he reminded the Charlestonians; "true soldiers and magnanimous citizens must brandish the pick-axe and spade, as well as the sword, in defense of their country."[6] Determined that the army would contribute its best effort, Lee ordered Moultrie to provide Massenbach with the workmen and materials needed to complete the works.

On Sullivan's Island Lee's major concern was protecting the fort's rear (north side) and providing a means of escape to the mainland. Massenbach himself was "frighten'd out of his wits" because retreat from Sullivan's Island appeared so precarious.[7] Lee personally oversaw the addition of a traverse, breastwork, banquette, and other works on the fort's vulnerable rear.[8] He was particularly concerned that Ferdinand de Brahm, an engineer employed by South Carolina, did not know the degree of talus required for the traverse.[9] Lee ordered Moultrie to monitor de Brahm's performance closely and promised, if necessary, to try to supply someone with more experience.

Col. Moultrie's memoirs vividly describe American preparations for the inevitable attack. Of special importance was Lee's initial view that the existing fort was "a slaughter pen" which ought to be abandoned. But that course being unfeasible politically and psychologically, Lee set about to provide a means of retreat. Despite the general opinion that two frigates could reduce the town, Moultrie maintained consistently that the fort could hold against both the fleet *and* Clinton's land forces.

1. "I NEVER WAS UNEASY ON NOT HAVING A RETREAT"

From William Moultrie's memoirs.

At this time [April 1776] it was the general opinion, especially among the sailors, that two frigates would be a sufficient force to knock the town about our ears: notwithstanding our number of batteries with heavy cannon; but in a few weeks (28 June) experience taught us, that frigates could make no impression upon our palmetto batteries.

April. General [John] Armstrong arrived from the northward, and took command of the troops in South-Carolina; he was a brave man, and a good officer, but not much acquainted with our manner of defence which was principally forts and batteries, with heavy pieces of cannon: we had at that time at least, 100 pieces of cannon mounted in different parts of our harbor.

May 31. Expresses were sent to the president[10] from Christ-church parish, informing him that a large fleet of British vessels were seen off Dewee's Island, about twenty miles to the northward of the bar; and on the first of June they displayed about fifty sail before the town, on the out side of our bar. The sight of these vessels alarmed us very much, all was hurry and confusion, the president with his council busy in sending expresses to every part of the country, to hasten down the militia; men running about the town looking for horses, carriages, and boats to send their families into the country; and as they were going out through the town gates to go into the country, they met the militia from the country marching into town; traverses were made in the principal streets; fleches thrown up at every place where troops could land; military works going on every where, the lead taking from the windows . . . to cast into musket balls, and every preparation to receive an attack, which was expected in a few days.

June 4. General [Charles] Lee arrived from the northward, and took the command of the troops; his presence gave us great spirits, as he was known to be an able, brave, and experienced officer, though hasty and rough in his manners, which the officers could not reconcile themselves to at first; it was thought by many that his coming among us was equal to a reinforcement of 1000 men, and I believe it was, because he taught us to think lightly of the enemy, and gave a spur to all our actions. After Gen. Lee had waited upon the president, and talked with him upon his plan of defence, he hurried about to view the different works, and give orders for such things to be done as he thought necessary; he was every day and every hour of the day on horse back, or in boats viewing our situation and directing small works to be thrown up at different places; when he came to Sullivan's Island, he did not like that post at all, he said there was no way to retreat, that the garrison would be sacrificed; nay, he called it a "slaughter pen," and wished to withdraw the garrison and give up the post, but president Rutledge insisted that it should not be given up. Then Gen. Lee said it was "absolutely necessary to have a bridge of boats for a retreat;" but boats enough could not be had, the distance over being at least a mile. Then a bridge was constructed of empty hogsheads buoyed at certain distances, and two planks from hogshead to hogshead; but this would not answer, because when Col. [Thomas] Clark was coming over from Haddrell's [Point], with a detachment of 200 men; before they were half on, it sunk so low, that they were obliged to return: Gen. Lee's whole thoughts were taken up with the post on Sullivan's Island; all his letters to me show how anxious he was at not having a bridge for a retreat; for my part, I never was uneasy on not having a retreat because I never imagined that the enemy could force me to that necessity; I always considered myself as able to defend that post against the enemy. . . . Besides had they made their landing good, the riflemen would have hung upon their flanks for three miles as they marched along the beach, and not above fifty yards from them.

Col. Thompson had orders that if they could not stand the enemy they were to throw themselves into the fort, by which I should have had upwards of 1000 men in a large strong fort, and Gen. Armstrong in my rear with 1500 men, not more that one mile and an half off, with a small arm of the sea between us, that he could have crossed a body of men in boats to my assistance, this was exactly my situation; I therefore felt myself perfectly easy because I never calculated upon Sir. Henry Clinton's numbers to be more then 3000 men; as to the men-of-war, we should have taken every little notice of them if the army had attacked us.

Gen. Lee one day on a visit to the fort, took me aside and said, "Col. Moultrie, do you think you can maintain this post." I answered him "Yes I think I can," that was all that passed on the subject between us: another time Capt. Lamperer, a brave and experienced seaman, who had been master of a man-of-war, and captain of a very respectable privateer many years ago visited me at the fort after the British ships came over our bar;

while we were walking on the platform looking at the fleet, he said to me: ''well Colonel what do you think of it now,'' I replied that ''we should beat them.'' ''Sir'' said he ''when those ships (pointing to the men-of-war) come to lay along side of your fort, they will knock it down in half an hour,'' (and that was the opinion of all the sailors,) then I said, ''we will lay behind the ruins and prevent their men from landing.''

Gen. Lee, I was informed, did not like my having the command of that important post, he did not doubt my courage, but said ''I was too easy in command,'' as his letters shew; but after the 28th June he made me his bosom friend: our fort at this time was not nearly finished; the mechanics and negro laborers were taken from all the works about the town, and sent down to the Island to complete our fort, we worked very hard, but could not get it nearly finished before the action.

—Moultrie, *Memoirs,* 1:139–44.

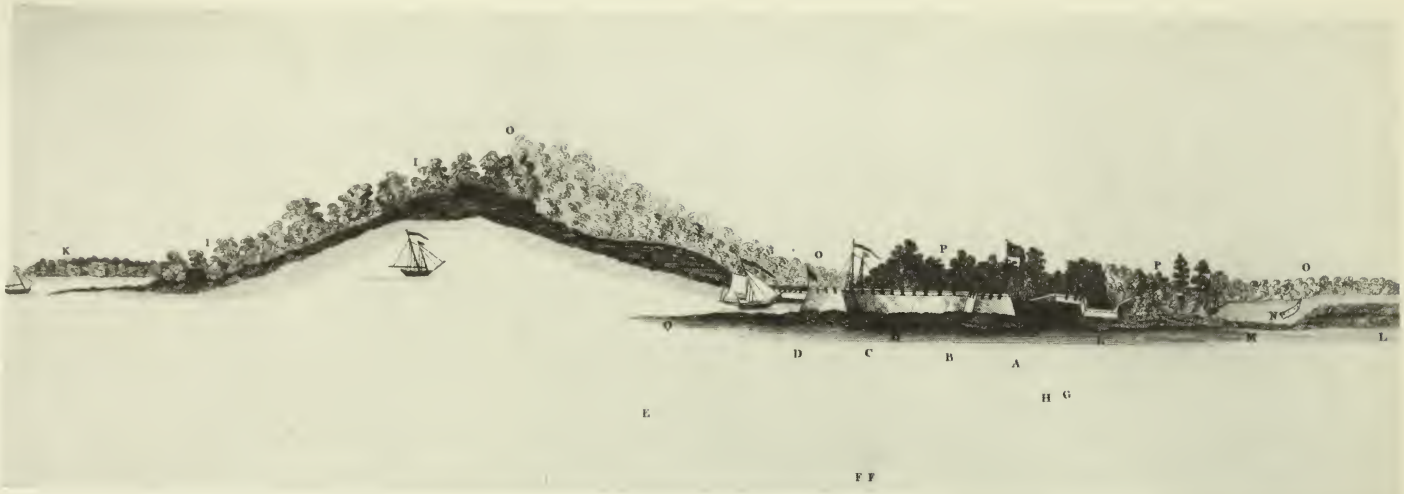
On the morning of 28 June 1776 the enemy launched an attack against Fort Sullivan. A surgeon on the British fleet described the rebels' response: "The Provincials reserved their fire until the shipping were advanced within point blank shot . . . it was slow, but decisive indeed; they were very cool, and took great care not to fire except their guns were exceedingly well directed."[11] In the observer's view the rebel artillery was "surprisingly well served" under command of Massenbach and de Brahm. The surgeon further noted that "General Lee had made such a disposition of masked batteries, troops, etc. that it is the opinion of all the officers of the Army . . . that if our troops had attacked, they must have been cut off."[12]

As Moultrie explained in his memoirs, an accident doomed the British naval attack on the fort's west side. Had that maneuver succeeded, Moultrie realized, "they would have enfiladed us in such a manner, as to have driven us from our guns." Also, as demonstrated elsewhere, unforeseen circumstances thwarted Clinton's attempts at a coordinated flanking movement. But it seems clear from Moultrie's account that the fort's palmetto construction and the accuracy of the rebel artillery fire were still crucial to the outcome.

2. ''NEVER DID MEN FIGHT MORE BRAVELY, AND NEVER WERE MEN MORE COOL''

From William Moultrie's memoirs.

June, 1776. On the morning of the 28th of June, I paid a visit to our advance guard (on horse back three miles to the eastward of our fort) while I was there, I saw a number of the enemy's boats in motion, at the back of



SULLIVAN'S ISLAND. *The British attack on the western end of Sullivan's Island 28 June 1776 is depicted in this engraving. The letters refer to the following:* A. Active, *28 guns;* B. Bristol, *under Sir Peter Parker, 50 guns;* C. Experiment, *50 guns;* D. Solebay, *28 guns;* E. Syren, *28 guns;* F. Acteon, *28 guns, and* Sphynx, *20 guns;* G,H. Thunder Bomb *with the* Friendship, *an armed vessel of 28 guns;* I,J. *Mount Pleasant;* K. *Hog Island;* L. *Sullivan's Island;* M. *A narrow isthmus;* N. *An armed hulk to defend the isthmus;* O. *The continent;* P. *The Myrtle Grove;* Q. *The western end of Sullivan's Island and the fort erected upon a peninsula.*

Library of Congress

Long-Island, as if they intended to descent upon our advanced post; at the same time I saw the men-of-war loose their topsails; I hurried back to the fort as fast as possible; . . . I immediately ordered the long roll to beat, and officers and men to their posts: We had scarcely manned our guns, when . . . ships of war came sailing up, as if in confidence of victory; as soon as they came within the reach of our guns, we began to fire; they were soon a-breast of the fort . . . let go their anchors, with springs upon their cables, and begun their attack most furiously about 10 o'clock, A. M. and continued a brisk fire, till about 8 o'clock, P. M. . . .

The Thunder-Bomb had the beds of her mortar soon disabled; she threw her shells in a very good direction; most of them fell within the fort, but we had a morass in the middle, that swallowed them up instantly, and those that fell in the sand in and about the fort, were immediately buried, so that very few of them bursted amongst us: At one time, the Commodore's[13] ship [the *Bristol*] swung round with her stern to the fort, which drew the fire of all the guns that could bear upon her: we supposed he had had the springs of her cables cut away: The words that passed along the plat-form by officers and men, were, "mind the Commodore, mind the two fifty gun ships:" most all the attention was paid to the two fifty gun ships, especially the Commodore, who, I dare say, was not at all obliged to us for our particular attention to him; the killed and wounded on board those two fifty gun ships confirms what I say. During the action, Gen. Lee paid us a visit through a heavy line of fire, and pointed two or three guns himself; then said to me, "Colonel, I see you are doing very well here, you have no occasion for me, I will go up to town again," and then left us.

When I received information of Gen. Lee's approach to the fort, I sent Lieut [Francis] Marion, from off the plat-form, with 8 or 10 men, to unbar the gate-way, (our gate not being finished) the gate-way was barricaded with pieces of timber 8 or 10 inches square, which required 3 or 4 men to remove each piece; the men in the ships tops, seeing those men run from the platform concluded 'we were quitting the fort,' . . . Never did men fight more bravely, and never were men more cool; their only distress was the want of powder. . . .

There cannot be a doubt, but that if we had had as much powder as we could have expended in the time, that the men of war must have struck their colors, or they would certainly have been sunk, because they could not retreat, as the wind and tide were against them; and if they had proceeded up to town, they would have been in a much worse situation: They could not make any impression on our fort, built of palmetto logs and filled in with earth, our merlons were 16 feet thick, and high enough to cover the men from the fire of the tops: The men that we had killed and wounded [12 killed, 24 wounded] received their shots mostly through the embrasures.

An author, who published in 1779, says "the guns were at one time so long silenced, that it was thought the fort was abandoned; it seems extraordinary that a detachment of land forces were not in readiness on board of the transports, or boats, to profit of such an occasion."

The guns being so long silent, was owing to the scarcity of powder which we had in the fort, and to a report that was brought me, "that the British troops were landed between the advance-guard and the fort;" it was upon this information, that I ordered the guns to cease firing, or to fire very slow upon the shipping; that we should reserve our powder for the musketry to defend ourselves against the land forces, there being a great scarcity of powder at this time.

At one time, 3 or 4 of the men-of-war's broadsides struck the fort at the same instant, which gave the merlons such a tremor, that I was apprehensive that a few more such would tumble them down. During the action, three of the men-of-war, in going round to our west curtain, got entangled together, by which the Acteon frigate went on shore on the middle ground; the Sphinx lost her bow-sprit; and the Syren cleared herself without any damage; had these three ships effected their purpose, they would have enfiladed us in such a manner, as to have driven us from our guns: It being a very hot day, we were served along the plat-form with grog in firebuckets, which we partook of very heartily: I never had a more agreeable draught than that which I took out one of those buckets at the time; it may be very easily conceived what heat and thirst a man must feel in this climate, to be upon a plat-form on the 28th June, amidst 20 or 30 heavy pieces of cannon, in one continual blaze and roar; and clouds of smoke curling over his head for hours together; it was a very honorable situation, but a very unpleasant one. . . . at night when we came to our slow firing (the ammunition being nearly quite gone) we could hear the shot very distinctly strike the ships: At length the British gave up the conflict: The ships slipt their cables, and dropped down with the tide, and out of the reach of our guns. . . .

Early the next morning was presented to our view, the Acteon frigate, hard, and fast aground; at about 400 yards distance; we gave her a few shot, which she returned but they soon set fire to her, and quitted her. . . .

THE CHEVALIER DE CAMBRAY-DIGNY. *This Italian-born officer-candidate in the French artillery received his commission in the Continental Army as a lieutenant colonel of engineers in June 1778. As Brigadier General Lacklan McIntosh's chief engineer, Cambray (1751–1822) built Fort McIntosh, about thirty miles northwest of Pittsburgh on the Ohio River, in November 1778. The fort, which was abandoned in August 1779, was designed to help curb Indian raids on the frontier. Cambray also served as an engineer during the siege of Savannah in 1779 and at Charleston in 1780. Charles Willson Peale painted this portrait of the chevalier.*

Independence National Historical Park Collection

> The other ships lay at the north point of Morris's Island we could plainly see they had been pretty roughly handled, especially the Commodore.
>
> . . . A few days after the action, we picked up, in and about the fort, 1200 shot of different calibers that was fired at us, and a great number of 13 inch shells.
>
> **—Moultrie, *Memoirs,* 1:174–81.**

Lee, who confessed "I never in my life felt myself so uneasy," was astonished by the defenders' courage. He attributed the low number of American casualties to the strength of the works and praised the valiant efforts of the South Carolinians.[14] His last-minute drive to fortify Charleston proper had brought the city to a remarkable state of readiness. Even had the outer defenses fallen, Charleston doubtless could have held on.

The repulse of the British at Charleston was a sweet victory indeed. For two years the enemy declined further action in the south. But at the time Lee took little comfort in the outcome: as an astute officer he feared the British would soon return and, worst of all, find his countrymen unprepared. "It is not impossible," Lee cautioned, "that the late repulse of the Enemy may be fatal to us. We seem now all sunk into a most secure and comfortable sleep."[15] Throughout the war that lethargic tendency to support defensive works only in the face of a direct enemy threat—and even then begrudgingly—was sometimes the rebels' worst enemy. In fact Lee spent the remainder of his service in the Southern Department trying to convince local authorities to upgrade their defenses.

Shortly after the victory at Charleston Lee took personal command of Continental forces in Georgia. He met with state deputies and suggested immediate measures for local defense. Lee appealed to the Continental Congress for money and urged South Carolinians to help out too. On the Georgia frontier Indians were a constant menace. Lee proposed using the row galleys, armed boats, and small forts or redoubts to protect the state's extensive waterways. In Georgia as in South Carolina he encountered on the one hand reluctance to act and on the other a tendency to propose unattainable schemes. "I shou'd not be surpris'd," Lee declared in exasperation, "if they were to propose mounting a body of Mermaids on Alligators."[16]

During the summer of 1776 Lee's major concern in South Carolina was to construct a chain of at least four redoubts to bolster Sullivan's Island and secure the two bridges linking it with the mainland. Without the new works he believed it would be "a very precarious Post."[17] He assigned Massenbach to lay out the new defenses.[18] In view of the plans for Georgia, for Sullivan's Island, and for some new works at nearby Port Royal, it was little wonder that Lee again implored Congress to send him more engineers. "It is really impossible to carry on the public business without them," he complained.[19] But it was still 1776: trained engineers were everywhere in short supply. In the fall of 1776 Lee returned north.

For the next two years the enemy conceded control of the south to the rebels, but in late 1778 they began a campaign to conquer the region. Savannah, Georgia, was their first target. Having gone for months without a scare, the city had let its fortifications crumble. With defenses weakened and troops hopelessly outnumbered and outflanked, the Americans were forced to give up Savannah in the final days of 1778. Quick capture of Sunbury and Augusta followed. Royal authority was reestablished in Georgia.

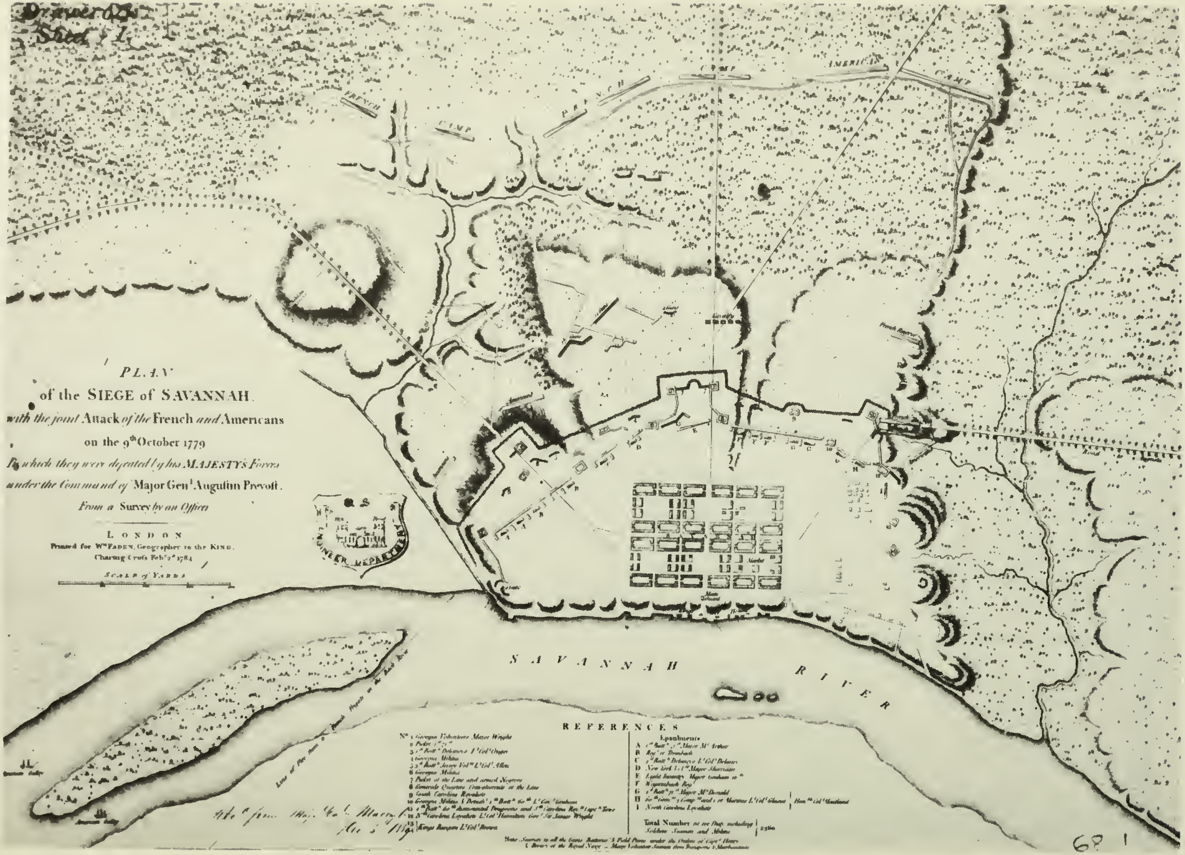
In May 1779 British General Augustine Prevost drove Colonel Moultrie from Purisburg, South Carolina, to Charleston. This time Charleston's mainland defenses were more advanced than in 1776 but they were far from formidable. Col. Charles Senf,[20] the state's engineer, worried that the lines were too weak to hold back Prevost's men. Initially the patriots seriously considered giving up the city but finally resolved to fight it out. The Chevalier de Cambray-Digny, a lieutenant colonel in the Army Corps of Engineers, worked feverishly to shore up the lines on the left where they were weakest. Townsmen labored day and night under his direction to fortify Charleston Neck between the Ashley and Cooper rivers.[21] The rebels' change of heart discouraged Prevost and he withdrew to Stono Ferry, South Carolina.

Maj. Gen. Benjamin Lincoln, commander of the Southern Department since September 1778, attacked Prevost's entrenched camp on June 20. Well covered and reinforced, the British beat back the assault. Lincoln was confident his men could win by storming the enemy's works, but an unreconnoitered creek running in front of Prevost's redoubts deterred them.[22] Among the wounded at Stono Ferry was Col. Jean Baptiste Joseph, the Chevalier de Laumoy, commander of the engineers during the attack.

Lincoln's biggest chance came in September 1779 when the French admiral Count d'Estaing arrived off Savannah with a fleet of thirty-three vessels. The Americans' hopes of liberating Georgia never seemed brighter. On the 16th d'Estaing demanded surrender. The weakened British garrison cleverly asked for a 24-hour reprieve, managed to get reinforcements, and decided to defend the city after all. Taking advantage of the delay, Capt. James Moncrieff, an engineer veteran of the Seven Years' War and the chief British engineer in Savannah, used slaves to strengthen his defenses.

Although Colonel Moultrie favored a direct attack, d'Estaing, advised by his engineers that a siege would take only ten days, opted for the latter. By October 8 d'Estaing was so frustrated by the slow progress of the trenches that he decided to abandon formal siege operations and make an immediate assault on the enemy's right at Spring Hill Redoubt. Reconnaissance reports by Laumoy and others assured him of success.

Unfortunately Prevost had recognized his vulnerability on the right and was prepared. The assault ended in disaster for the rebels. Only Bunker Hill was bloodier. Wounded, d'Estaing retreated to his flagship, while Lincoln withdrew to Charleston.


PLAN
of the SIEGE of SAVANNAH.
with the joint Attack of the French and Americans
on the 9th October 1779
In which they were defeated by his MAJESTY'S Forces
under the Command of Major Genl. Augustin Prevost.
From a Survey by an Officer
LONDON
Printed for Wm. Faden, Geographer to the King.
Charing Cross Feby. 2d. 1784
Scale of Yards
FRENCH CAMP
AMERICAN CAMP
SAVANNAH RIVER
REFERENCES
Epaulments
Total Number
ENGINEER DEPARTMENT
Drawer 63 Sheet 1
68 1

Antoine François Térance O'Connor, d'Estaing's chief engineer, kept a journal of the operation. Later d'Estaing added his own observations to the account. The combined document—presented below with d'Estaing's comments in italics—illustrates some of the difficulties encountered in attempts at Franco-American cooperation.

3. "THIS STRANGE SIEGE WAS THE WORK OF PENELOPE"

From Antoine O'Connor's journal, with observations (in italics) by Count d'Estaing.

Laying siege to a fortified place defended by a force almost equal to the one attacking it would seem to be absolutely impossible. My entire conduct would have been so if I had pursued objectives other than placing and supporting batteries as close as possible, intending to breach the sand works, making an approach by a trench, standing our ground at captured points and assaulting by column at one point an equally strong enemy, who was waiting for us and six hours earlier had dug to the rear a new trench supported by cannon. This indisputably would have been an entirely new chapter in the history of siege warfare.

The incalculable advantage of having cover within 400 yards of the enemy and of attacking suddenly determined the point of attack. It was also better than the other side because it was closer to the mouth of the Savannah River from which I was expecting large cannon that the men-of-war were to send me.

The Americans volunteered to furnish all the necessary tools and even workmen for the trenches. Work was easy in this soft, sandy soil.

On the 23rd [September 1779] the small number of tools that the Americans supplied together with our own, were scarcely sufficient for 300 workers.

At 7 p.m. I began digging the trench with 300 workers, supported by 600 grenadiers and chasseurs. The enemy only fired a few cannon shots at random, and despite our close proximity and the bright moonlight, they did not detect our presence.

During the night I dug a trench 206 yards long and started at the end of it a parallel trench 80 yards long which was only 300 yards away from their works.

SIEGE OF SAVANNAH, OCTOBER 1779. *This plan from a survey by an unidentified officer depicts British fortifications and American and French siege positions. Spring Hill Redoubt (11) is on the right. The French and American parallels are in the left center.*
National Archives

At dawn on the 24th the trench commander received orders to withdraw the workers and replace them with half of the guard for the trenches; the rest remained under arms in the trench and occupied that part of the parallel which was finished.

It is the nature of Americans to promise much and deliver little, this nation always counts on acquiring whatever it lacks. Most of the tools were gathered up from houses. They were hardly suitable for digging a trench, but the soil was so soft that they sufficed.

At 8 a.m. after a light enemy barrage three or four hundred enemy soldiers ambushed us on the left. The cry "to arms" went up as soon as they reached the parallel; our troops abandoned the trench, took up a position on the flank and repelled the enemy after a very hot exchange of musket fire. . . .

Our losses amounted to four officers killed, nine wounded, twenty-five chasseurs and grenadiers killed and sixty-six wounded. The enemy's could not have been less.

They asked for a cease-fire in order to collect their dead and wounded. . . .

On the night of the 24th we were supposed to continue the parallel up to the barracks, and the Americans were to dig another one up to that point from their side. The smaller number of tools and workers available convinced M. le general[23] to construct a battery immediately behind the communication trench and a little above the center of it. In this position it was only 425 yards away from the barracks.

The placement and construction of this battery have been justifiably criticized. The primary defect of its position compromised its effectiveness. That was recognized too late and later confirmed when we set up there a sufficient number of cannon to open fire on the barracks. Only on the left did the battery have the barracks in range. Moved forward a few yards and to an angle, the battery could have blown the barracks to pieces and had within its circular range not only the barracks but also the whole line of fortifications as far as the Spring Hill redoubt. Indolence often produces a lack of resourcefulness and too frequently prevents correcting mistakes that are made.

Because the communication trench between headquarters and the siege lines was not safe, M. le general ordered two more perpendicular trenches to be dug to the rear of the first one, and 300 Americans were busy at it during the night. This work was interrupted by the flight of the workers because of a false alarm. However, they resumed working after an hour.

It was reserved to this siege, impromptu in its origin, slow in its progress, and discreditable in its procedure, to do last what we should have done first. The poor security in the interval between the trench and headquarters cost several lives. . . . When workers are in short supply, ex-

perience must dictate the necessity of a work project before it is undertaken.

One hundred fifty of our men worked on the left battery, and at dawn two 18-pound pieces were erected there at barbette. At 7 a.m. they commenced firing. M. de Sane, commander of artillery, was killed. M. le general went out and ordered the firing stopped and the cannon removed from the battery.

M. de Sane, a bright young officer but one who had never experienced a siege, shared the opinion, which was almost universal, even among the French, that the first discharge of cannon would make the fortress surrender. The night before I inspected the battery that he built. When I told him that it had no communication whatsoever, he responded that he had enough ammunition for the next day, that he had no reason to leave it or send for anything during the day. I reminded him that M. Duportail's system which he was using in that battery at barbette, was good only for defense and has several other disadvantages in the opinion of M. Gribauval.[24] *He multiplied them, when he should have used these fine gun carriages to coordinate the artillery with the engineers. I also mentioned to M. de Sane that the shallow depressions or foxholes between the cannon platforms that this system calls for, were not adequate to give cover to the cannoniers, and that, according to the same system, a semicircular path or small ditch between the recoil mechanism and the parapet was required so that the gunloaders would not be seen and could have protection from fire. He promised to carry out my suggestion and specifically pledged not to fire without an order from me. He sent a request for that order the next morning, and at that precise moment I heard the firing begin. I went there and found that it was hardest hit by cannon ball and grapeshot of any place I have ever seen.*

On the night of the 25th, 100 Americans dug a communication trench between the main siege line and the left battery, and they finished the two other communication trenches started the previous night. We closed in the left battery with embrasures and mounted twelve guns, six 18-pounders and six 12-pounders. One hundred fifty of our men were used. . . .

On the night of the 27th with 150 men we began again a battery eighty yards in front of the beginning of the perpendicular trench running to the parallel trench dug on the first day. Twelve guns were assigned to it, five 18-pounders and seven 12-pounders. On the same night eighty men dug a communication trench to get to it. . . .

Continuation of the battery on the left. On the 28th we started a mortar battery on the left, 800 yards behind the trench. It held nine mortars with caliber of six and nine inches.

In the Americans' opinion the mortars were the alliance's ark of the covenant. They would make the walls of Jericho fall. I hoped so; but I was skeptical.

The night of the 28th the batteries were continued, and the Americans began a mortar battery on the left, a redoubt to hold four 6-pounders on its left flank and a post for fifty to sixty men on its right. They were to support the mortar battery.

The purpose of this small battery with very light cannon was to protect the mortar battery and obstruct an attack on its left. The Americans built this battery very well and very quickly. The embankment of their merlons was made differently than ours, and their seemed better to me. . . .

The night of [October] 2nd was employed in the construction of this battery and the continuation of three others.

The night of the 3rd, continuation of the same work. We fired 300 firebombs on the city and the enemy fortifications.

These 300 firebombs were the prologue to the first mortar shells. The deserters said that they caused distress; however, the ground was all sand in the city and the streets were not paved. We chose to begin firing the firebombs at night in order to make them more terrifying. They are less frightening in the daytime, but they were supposed to scare even more the citizens who had to sleep outside the fortifications. We employed several other small stratagems. We put too much confidence in them; to depend primarily on fear or on the enemy's mistakes is the riskiest strategy of war. From the start of this campaign that was the shaky basis of our plans.

At dawn on the 4th all the cannon were trained on the enemy's guns, and the bombardment began. The *Truite* flute[25] and the two American galleys also fired on the town to impede communications. The enemy responded with very lively fire. At 2:30 p.m., the new five-gun battery commenced firing. . . .

The night of the 4th was used to repair our batteries' embrasures, and firing became very scattered and weak. Because of the scarcity of tools that the Americans could furnish us and the extreme fatigue of our troops, worn out from moving cannon and munitions, constructing gabions and saucissons, we were not able to use this night for digging new trenches.

On the 5th our batteries continued their fire and annoyed the enemy considerably. They responded with only occasional cannon fire.

Here then was the high point of a siege, the moment when you fire and are no longer fired on, when the works are proceeding rapidly, when conquest comes almost without risk. Ordinarily it is the occasion of success and foreshadows the day of capitulation. Our position was quite different. The movements we saw in the interior lines told us that we had won nothing; new trenches were dug while the old ones were neither abandoned nor taken. If we took possession of the top of the walls, it would be endless. If we tried to pass between the cannon, of which they had more, we would find them newly placed on our flanks. They would reappear, they would fire, they would exact almost as many casualties as if the for-

tress had never been taken, and we would find in the interior trenches new obstacles to overcome. This strange siege was the work of Penelope.[26]

The enemy worked untiringly on the interior lines and moved much artillery.

On the night of the 5th nothing was done; the army, fatigued by work and by the sickness brought on by the intemperate climate, was not in a position to furnish workers. . . .

On the 6th a hard rain slowed down our batteries' fire. Despite the bad weather, I opened a communication trench that night with 150 Americans about 160 yards from the enemy battery at the barracks, and I opened a parallel trench at the end of it. At midnight this work was interrupted by the flight of the workers because of a false alarm. Some of the tools were lost. However, I reassembled part of the workers; and, after giving them new tools, the work continued until dawn. This communication trench and parallel were ready to hold fifty grenadiers who were stationed there, and the trench was improved during the day of the 7th.

On the night of the 7th we were supposed to elongate this new parallel, to construct a battery on its left to destroy the one at the barracks, and to build another one further away, to the left of the Spring Hill redoubt. The lack of tools, the time necessary to construct this new battery, reasons perhaps based on the scarcities suffered by the fleet, persuaded M. le general to order an assault on the Spring Hill redoubt on the enemy's right.

The purpose of this new siegework was to attract the enemy's attention and our own. It was essential to convince everyone that we intended to proceed according to the rule of siege warfare and continue our works up to that point. The assault was decided upon; General Lincoln demanded it. Of course I hoped that it would succeed, but I was quite far from thinking that success was mathematically inevitable. If I had been by myself, I would not have attempted it at all. . . . The besieged had enough supplies for more than two months, and we did not. To mount a new regular attack, open a trench on another front and raise batteries there, which we could not support because of their distance from the camp, was entirely an American idea. Implementation of it would have been impossible. To let others think we would do so, however, was my intention. . . .

The different scouting missions that M. de Saumoy [Laumoy], an engineer presently in the American service, had ordered on that front, those that he had undertaken personally, the unanimous report of the different deserters, everything seemed to promise a favorable outcome.

On the morning of the 8th M. le general again went to reconnoiter the right side of the Spring Hill redoubt. The day was spent making dispositions for the attack. Twenty-two hundred of our troops and 1,000 Americans were selected for the attack on that section. The rest of the troops, assigned to the trenches, had orders to make two successive sorties, the first one on the right and the second one on the left. Five hundred Americans were ordered to penetrate the city to the left of the enemy trenches and as close to the river as possible. The two American galleys and a few longboats had orders to make a feint attack by way of the river. . . .

On the 9th at midnight the army took up arms; at 3 a.m. we marched toward General Lincoln's camp where M. le general ordered a halt to wait for the scouts that they were obliged to furnish us. The American general could provide only one, and at 4 a.m. the two armies set out together for the Spring Hill redoubt, a mile away. Coming out of the woods a half mile from the enemy, a halt was called to close up the columns in accordance with the manner stipulated in the orders. . . . At 4:30 a.m. the army began to march. . . . Toward five o'clock we heard the musket fire of the diversionary attacks on the enemy's left. M. le comte de Bethisy's *avant-garde* penetrated to the abatis and chopped through it with hatchets. Immediately the enemy was within pistol range. A single volley of musketry and one round of cannon fire caused a great disorder. However, the vanguard jumped into the ditch which lay before them and uselessly climbed up the side. The cannon pieces which defended this ditch took a frightful toll. . . . Brisk grapeshot fire directed toward our left pushed part of our troops into the marsh. All of this created the greatest confusion, and the vanguard troops, realizing they had no support, were forced to fall back. They charged a second time without success. Disorder increased; most of the officers were wounded; part of the troops coming out of the marsh crowded into the others and confused the order of attack. However, M. le general partially rallied them, and the vanguard charged a third time, supported by the troops that M. le general had just reassembled. The charge lasted a long time; the enemy cannon exacted heavy losses; the fire of the Scotch Regiment which protected the redoubt was particularly galling. M. le general, wounded a second time by a ball through his leg and witness to the confusion which began again, ordered the retreat. M. le vicomte de Noailles covered it at the head of the reserve.Our troops suffered greatly in the retreat. M. le vicomte de Noailles formed the rear guard, and the enemy, who came out to their abatis, did not dare a sortie when they saw the determination and discipline of our rear guard, exposed to their cannon loaded with grapeshot.

The action did not last longer than an hour; it was very violent. The enemy, almost as numerous as we, as we learned later, had gathered the greater part of their force around the Spring Hill redoubt; and it appears certain that two American deserters alerted them about the point of attack the day before. That no attention at all was paid to the two feint attacks from the trenches is even more reason for thinking so. The diversion that 500 Americans were to attempt on the enemy's left did not take place.

They got lost. The two American galleys caused the attack from the river to fail. The first one, towed by longboats, dropped anchor. The second one was filled full of water, and M. le chevalier Durumain, ship's lieutenant who commanded this operation, could never get upriver as far as the city. . . .

On the 10th, 11th, 12th, 13th, 14th, 15th, 16th, and 17th we were busy withdrawing the cannon and all their munitions. We loaded them at Thunderbolt on the Augustine Creek. All the wounded and the army's baggage were also loaded.

On the evening of the 18th the army abandoned the camp before Savannah, after the departure of the American army.

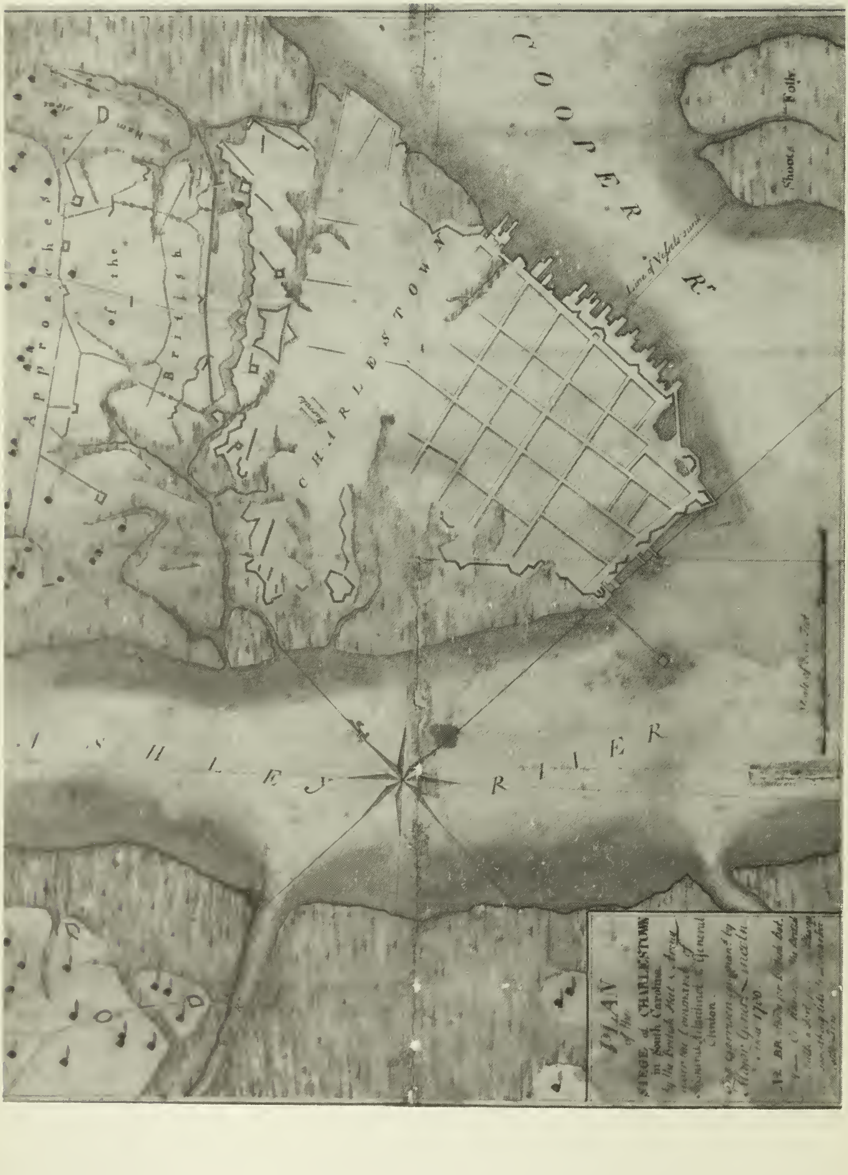
—Kennedy, *Muskets*, pp. 54–57, 59, 61–65, 67–69.

The failure of the French and American allies to retake Savannah encouraged British leaders to revive plans to capture Charleston. In fact, before the end of the year, Clinton left New York City on an expedition to do just that. The second week in February 1780, when Clinton arrived on Johns Island, thirty miles below Charleston, the city's fortifications were in shambles. Improvements were needed both north of the city and at Forts Moultrie[27] (Sullivan's Island) and Johnson (James Island), guarding the entrance to the harbor. In an attempt to reverse months of neglect, the state acted quickly. On Charleston Neck, a narrow isthmus connecting the city with the mainland to the north, the patriots readied a 1½-mile line of defenses. A masonry hornwork known as "the Citadel" stood in the center of this line. A sixteen-gun redoubt held down the southern tip of the city and thirteen additional forts were scattered along the Ashley and Cooper rivers.

By April 1 the British were in position to invest the city. Within a week enemy vessels had sailed past Fort Moultrie. The enemy's first parallel, engineered by Moncrieff, who had been promoted for his contributions at Savannah, was complete on the 10th. Clinton called on Lincoln to surrender. He refused, so the British general proceeded with a second parallel.

Despite heavy American artillery fire, the British continued to push forward. An American counterattack on April 24 proved only a temporary setback. By May 10 Clinton was within thirty paces of the American works, the firing of the chasseurs, light infantry troops armed with rifles, proved decisive. The city was doomed. Lincoln capitulated on the 12th. In doing so he surrendered an army of more than 200 officers, including seven generals and better than 2,300 non-commissioned officers and privates. The loss was stunning.

Ferdinand de Brahm, now a major in the Corps of Engineers, left an account of the siege, beginning with Clinton's arrival on February 9.[28] The journal is the most detailed record by an American engineer officer of the southern campaign prior to Yorktown.

PLAN of the SIEGE of CHARLESTOWN in South Carolina by the British Fleet & Army under the Command of Admiral Arbuthnot & General Clinton.
The Garrison command'd by Major General Lincoln
1780
COOPER R.
Shoals
Folly
Line of Vessels sunk
CHARLESTOWN
Approaches of the British
ASHLEY RIVER

4. AN ENGINEER DESCRIBES THE SIEGE OF CHARLESTON, 1780

From Ferdinand de Brahm's journal.

February 9, 1780—The English fleet arrived in Stono Inlet; the alarm was fired in Charlestown.

10th—The troops landed.

March 9 and 10, 1780—Seven vessels were sunk near the mouth of Cooper River, and cables fixed from one to the other, to prevent the entrance of this river.

13th—The enemy took possession of the land on Ashley River opposite the town, constructed a battery near the mouth of Wappoo, on the prolongation of Tradd Street.

21st—The English fleet passed the bar, and anchored in Five Fathom Hole.

25th—Our armed vessels before Fort Moultrie returned to town; their cannon were transported into the land batteries.

29th—The English army crossed Ashley River twelve miles above the town.

30th—The advanced guard of the enemy came within two miles of Charlestown, when a party of two hundred men, under Colonel John Laurens (and a little while after two field-pieces), went out against them, who, after a skirmish of some hours, returned towards sun-set. The fortifications of Charlestown were, even at this time, very incomplete. All the negroes in town were impressed, who, together with the parties detailed from the garrison, were henceforth employed upon the works.

31st—At day-break we observed that the enemy had opened his trenches in three places.

April 1 and 2, 1780—The enemy's works were a little extended, and ours augmented.

3d—This morning the battery was discovered upon a height, at Hampstead. A battery of four pieces was constructed on our right to oppose that of the enemy, from which, as well as from all the others, a continued firing of shot and bombs was kept up the following night along the lines.

4th—This morning, daylight discovered to us the enemy's battery very much injured.

5th—Last night's fire of our batteries was kept up as heretofore. The enemy's galley approached the town, and fired upon it all night. We began to dig wells in our front, and to close up the gorge of the horn work [the Citadel].

SIEGE OF CHARLESTON, 1780. *Ferdinand de Brahm, one of several skillful cartographers in the Revolutionary War Corps of Engineers, sketched this plan of British approaches and American defenses as they appeared in 1780.*

Engineer Museum, Fort Belvoir, Virginia

6th—The fire of the batteries and the works continued as before. Today the reinforcement under General Woodford arrived.

7th—Very little fire from our batteries last night, and more on the part of the enemy. The enemy has prolonged the right of his first parallel. All our workmen employed digging wells.

8th—Last night the enemy commenced a battery of six pieces. All our workmen employed making traverses. A quarter of an hour before sunset, the English fleet passed Fort Moultrie, under a heavy fire on both sides, and anchored in a line near Fort Johnson. Nobody wounded or killed in Fort Moultrie. The fleet consisted of the following vessels:—One of 50 guns, two of 40, four frigates, two vessels armed *en flute*, and two other smaller ones; one of these armed *en flute* grounded on a bank called "The Green."

9th—The vessel which grounded was abandoned, and burnt by the crew last night. This morning the commencement of a battery appeared in front of our left. Our workmen employed as heretofore.

10th—The works of the enemy were advanced. Our negroes employed in making a battery of five pieces in redoubt, and the soldiers on fatigue in making traverses. This evening a parley was received from the enemy, demanding the surrender of the town; it was refused.

11th—Our batteries kept up a great deal of fire last night. The enemy had repaired his batteries, and mounted some cannon. Finished the battery in the redoubt. Our workmen employed in making traverses, and strengthening the profiles of some works. This evening Major Gilbank was accidentally killed, making some experiments with shells.

12th—Very little firing last night. The enemy had more cannon mounted. The workmen employed as before. Our sailors employed in elevating the parapet near Exchange Battery, and making embrasures to it. At 12 o'clock, meridian, three chalops [Shallops] passed Fort Moultrie, and joined the fleet, although fired upon all the time by the Fort.

13th—Very little firing last night. This morning one of the batteries of the enemy was finished, the others not quite; the trenches extended. This morning, at 9 o'clock, the enemy opened his batteries, firing bombs, carcasses and hot balls, which were returned with all our force from the batteries. This lasted about two hours, when the firing was abated on both sides, till about 5 o'clock, when all the fire was on the side of the enemy. We had one 18 pounder dismounted, and two houses burnt in town. Our workmen employed as before.

14th—A slow fire was kept up on both sides last night. The approaches of the enemy a little advanced. The enemy's galley fired all night. He commenced another battery opposite the town, on the banks of Ashley River.

15th—Fire from the batteries and works as before. The enemy had a bomb battery. His second parallel commenced, and manned by the Chasseurs, who kept up a continued fire upon our lines.

16th—In addition to his usual fire, the enemy opened his new battery. Last night we extended from our redoubt a counter-mine with a small parallel whence we could return the fire of the enemy's musketry. This evening one of our Gallies ascended Cooper river to a place whence she enfiladed the English camp for several hours, which was briskly answered by field pieces from the camp.

17th—The enemy enfiladed the town on all sides last night and threw a great quantity of bombs—sometimes from fifteen to twenty at once. We worked upon our counter mine. We received intelligence from our detachment at Lamprieres [Lempriere's Point], that one thousand or fifteen hundred of the enemy under General Lord Cornwallis had passed Monk's Corner, Strawberry, Bonneau's Ferry, and Wappetaw, and actually arrived within six miles of the said post. This morning the enemy's second parallel was prolonged towards our left, supplied with bags of earth and full of Chasseurs.

18th—Fire from the batteries as heretofore, and a shower of musketry all day; this day like last night very rainy.

19th—Fire from the batteries as heretofore. This evening three of the enemies Gallies descended from Wappoo down Ashley river to the Fleet under a heavy fire from our batteries; one lost her main mast. This night the communication is made from the battery of the French sailors to the town.

20th—Fire from the batteries as ordinary. This evening the Ravelin commenced in front of the horn work.

21st—Fire from the batteries as ordinary. This morning the enemy had commenced two batteries, near his second parallel.

22d—Fire from the batteries as ordinary; and from the musketry more than ever. This morning a parley was sent to the enemy and the answer returned about 9 o'clock in the evening.

23d—Fire from the batteries as ordinary. The enemy extended the saps of his second parallel.

24th—Fire from the batteries as ordinary. This morning at daybreak, a party of two hundred men under Col. Henderson made a sortie up on the enemies works which caused a general fire of musketry on both sides. The party returned in a little while with twelve prisoners. Our loss was one Captain and one soldier killed.

25th—As ordinary. Last night Col. Parker of the Virginia line was killed by a musket shot.

26th—As ordinary. The enemy commenced his third parallel. Troops from a vessel and four gallies, landed at Mount Pleasant, and took possession of a battery of one piece, losing one galley in this affair.

27th—As ordinary.

28th—As ordinary. Last night our Fort at Lamprier's was evacuated, and taken possession of by the enemy to-day. It was not until this moment that Charlestown was completely invested; the enemy having possession of James Island, Wappoo, Charlestown Neck, Hobcaw Point, Lamprieres, and Haddrell's Point; and his fleet anchored in the Road-stead before the town.

29th—As ordinary. The enemy's third parallel almost finished, and a battery commenced; as likewise a redoubt on our side.

30th—As ordinary.

May 1st, 2nd, and 3rd—As ordinary. Our hospital ship taken by the English and carried higher up the river.

4th, 5th, and 6th—The enemy employed in making three batteries upon his third parallel. And we to make two redoubts.

7th—This morning at eight o'clock Fort Moultrie capitulated. A sixty-gun ship joined the English Fleet.

8th—As ordinary. Another redoubt was commenced last night in rear of our left line. This morning the enemy sent a parley again to demand the town—the truce was prolonged throughout the whole day. In a Council of War composed of all the officers of the General Staff, it was resolved by a majority of votes, to propose a capitulation.

9th—The enemy had cannon mounted in the batteries of his third parallel. The two commanders not agreeing upon the terms of capitulation the siege commenced this evening at nine o'clock with greater warmth than ever.

May 10th—As ordinary.

11th—As ordinary. The enemy's trenches are extended under the abbatis of the advanced battery. This afternoon a parley was sent to the enemy to propose fresh terms of capitulation.

12th—The terms were accepted, and the English army took possession of the town. The English have worked very hard upon the fortifications. All that I can learn is, that they have strengthened the profiles of the lines; that they have constructed a Fort at Hampstead . . . and some redoubts more advanced; they have also commenced a battery on Shultz's Folly—but the foundation is scarcely raised.

—Gibbes, *Documentary History*, 2:124–28.

Among the captured at Charleston was Army Chief of Engineers Louis Duportail. In the letter to Congress below, Duportail described the circumstances of capitulation and the debate over the terms of surrender. Throughout he evinced the Frenchman's concern that the situation be resolved without loss of honor. He also pointed out that upon arriving in late April he had judged the city must fall unless relieved. The full council of war had disagreed and flatly rejected his proposal to evacuate the city. "For my part," recounted Duportail, "[evacuation] only appeared to me difficult and hazardous and Such as we ought to risk in our present Situation." But he congratulated the Americans for courageously resisting the siege for so long and concluded "the Ennemy have not great Subject to triumph."

5. "IN ALL THIS THE HONOR OF THE AMERICAN ARMS IS SECURE"

Louis Duportail to the President of Congress.

Charleston, 17 May 1780

Sir

You will probably heard of the surrender of Charlestown by the time you will receive this letter. I arrived here the 25th of Apl.[29] at seven in the morning, after having passed during the Night in the Middle of the Ennemies, through the Woods with the assistance of good Guides. I found the Town in a desperate State almost entirely invested by the British Army and Fleet which had passed the Bar and Fort Moultrie. They had surmounted difficulties which were generally looked upon as insuperable without experiencing scarce any resistence. The Ennemy had brought their trenches upon the Neck within about 120 or 130 Yards from the Fortifications; in a word the fall of the Town was unavoidable unless an Army come to her assistance which then did not appear likely. After having examined the Situation of things I thought an evacuation highly advisable and I proposed it—but the Council found an impracticability in the Measure although for my part, it only appeared to me difficult and hazardous and Such as we ought to risk in our present Situation.

That Plan being rejected the only object was to protract the term of our Capitulation. I have done on my part every thing that was in my power to fulfill that object in the Same manner that Colonel Laumoy had before my arrival, but time brought us to lose sight of the term of our resistance. The Ennemy succeeded in draining part of the Ditch which was in front of our intrenchments and raised nine Batteries in their third Parallel. The day they opened them they Sent a flag with a Letter to summon General Lincoln to Surrender. Upon this a Council of Generals and field officers were called and after having asked whether terms ought to be proposed to the Ennemy and it was carried in the affirmative by great majority, I myself was of that number. As the first propositions were from the Ennemy we might expect advantageous Conditions, I had even Some hope that we might have Saved the Garrison; besides a positive refusal to treat with an Ennemy who within a few days could have been in a condition of giving us the law appeared imprudent and unreasonable. It was then determined in Council that propositions should be made, but afterwards by an extraordinary oversight they left to the General Officers the care of determining what was to be proposed. This is the moment where I left off taking any part in what has been done being of a contrary opinion to that of the other Genl. officers. They agreed to propose that the Continental Troops Should be prisoners of War. I opposed that measure with all my might. I represented that if even our situation required it, it was not our business to propose it and that we Showed an ignorance of what is practised in those cases which would make us appear in a ridicule light. I represented that if I had been of opinion with the greatest Number to propose terms to the Ennemy, I mean that they Should be honorable terms, both advantageous to the Army and Continent; as for instance to surrender the Town alone with the Artillery, Store and Ships; but to save the Troops; that if the army must be Prisoners of War it was more eligible to hold out in order to justify Such unfavorable Conditions by a longer resistance and more distressing Situation. My representations had not the desired affect. The propositions were made such as you will see them. Fortunately, Such as they were the majority would not grant them and proposed others less advantageous which General Lincoln did not however think proper to accept. The truce was broke and the operations of the Siege vigorously continued. But the second day after the Militia refused to do duty General Lincoln thought from this that the Capitulation was absolutely necessary and called the Council who countenanced the Measure; for my own part I thought that we ought to try before to bring the Militia to their duty by every possible Means, by acts of authority, and if necessary by exemplary punishments. This was likely deemed impracticable, and the Capitulation took place to my Great regrete Not that I think we could have held out longer than three or four days, but that we should have put the Ennemy in Such a Situation to render a further resistence on our part blamable to every body; then our defence would have done us much More honor. It is true that in that case the conditions would not likely have been the Same but I was for Sacrificing that advantage to a little more glory. Fortunately in all this the honor of the American arms is Secure and the Ennemy have not great Subject to triumph. To remain fourty two days in open trenches before a Town of an immense extent fortified by sandy Intrenchments raised in two months without covered way, without out works, open in Several places on the water Side, exposed every where to attacks and defended by a Garrison which was not sufficient by half to what was necessary, before Such a place I say and display all the appearance of a regular Siege, is nothing very glorious. The English General has perhaps followed the rule of prudence in conducting himself so—but at best the troops that he commanded have assuredly no reason to boast of their ardor or enterprising spirit; while on the other hand the American troops gave certain proof of their firmness to support, for more than forty days, a terrible fire—and to remain so long exposed to the danger of surprises, or attacks *de vive force,* which were certain of success if the enemy took its measures carefully.

M. de Laumoy and the engineers whom he has under his orders, have been so busy constructing the fortifications of Charlestown, both before and during the seige that there was no time to make a design of the plans—this deprives me of the satisfaction of sending them to Congress—supposing indeed the enemy would permit it.

—Papers of the Continental Congress, roll 181.

The British held the Charleston captives nearby at Haddrel's Point, where Duportail remained until he was exchanged in November 1780. In a letter to the Chevalier de La Luzerne, the French ambassador to the United States, Duportail starkly depicted the discomforts of his situation.

6. "I AM HERE IN A FLAT COUNTRY WHERE GREEN STAGNANT POOLS EXHALE CORRUPTION"

Louis Duportail to the Chevalier de La Luzerne.

7 July 1780

. . . At this moment, M. le Chevalier, you are doubtless living in one of the pleasant country houses near Philadelphia. You are enjoying the beautiful season of July—a moderate climate with pleasing prospects. I am sure you walk daily in cool woods—whereas I am here in a flat country where green stagnant pools exhale corruption—there is no water fit to drink—the soil is nothing but sand which burns the flat of the foot and blinds one when the wind blows. Although we are surrounded with woods we are not allowed to walk in them and they are of a kind of pine that gives no shade and interrupts the little air one might enjoy. Corn and potatoes are the only products of the country . . . one sees a few negroes—covered with a few miserable rags . . . and wretched peasants only a little less dark than their negroes—who go about barefooted and without education or politeness. . . . At night, if one does not have two mosquito nets there is no hope of closing the eyes. Even so the noise they make keeps one awake—any way, no matter what is done they manage to enter in an infinite number of places and the body is covered with bites which oblige one perpetually to scratch with both hands. I have had to stop this letter twenty times for that reason. You will see Monsieur, how we pass our time here, and you may judge how much I wish to leave this place. . . .

—Kite, *Duportail*, pp. 177–78.

After Charleston the rebel position in the south reached its nadir. The British controlled Georgia with redcoats stationed at Savannah and Augusta, and South Carolina with troops at Ninety-Six, Orangeburg, and Forts Granby, Watson, and Motte. Leaving Cornwallis behind to consolidate British strength, Clinton returned victorious to New York.

Over General George Washington's objections Congress appointed Maj. Gen. Horatio Gates, the hero of Saratoga, to replace Lincoln as commander of the Southern Department. Gates's mission was to revitalize patriot morale and win back territory. As evidenced by the disastrous American defeat at Camden (August 1780), he failed miserably. Thus in early December Congress gave the command to Maj. Gen. Nathaniel Greene, Washington's original choice. Greene acted decisively. Daringly dividing his army, he went on the offensive.

North Carolina's landscape was laced with rivers that could be either obstacles to success or instruments of mobility, depending upon circumstances and Greene's knowledge of the rivers. To learn more, the general called on Thaddeus Kosciuszko, his only engineer,[30] to reconnoiter the Catawba River. Greene also sent Lt. Col. Edward Carrington, an officer in the 1st Continental Artillery detailed to serve as Greene's quartermaster general, to explore the Roanoke and Dan rivers, and Brig. Gen. Edward Stevens, an officer in the Virginia militia, to explore the Yadkin River. Their orders required reports on the depth and flow of the rivers; the location of obstacles such as rocks, shoals, and falls; road conditions; and the distance between towns. In short, Greene wanted to know everything pertaining to transportation possibilities on the rivers year-round. The resulting surveys were the earliest made of these rivers. Although the reports do not survive, very likely they were invaluable to Greene's campaign.

Greene entrusted a variety of tasks to Kosciuszko, whom he once called "Master of his profession."[31] When Greene wanted a new camp where he could rest and train his army and repair equipment, he sent Kosciuszko to find the spot. After exploring the Pedee River in mid-December 1780, Kosciuszko chose an excellent site at Cheraw Hills, South Carolina. On 1 January 1781 Greene gave Kosciuszko an important new assignment: overseeing the construction of flat-bottomed boats to be transported overland in wagons and used by the army in amphibious operations.

Lacking enough men to make an effective stand, Greene led Cornwallis on a 200-mile chase toward Virginia. Intending to avoid capture by crossing into Virginia if necessary, Greene dispatched Kosciuszko ahead to erect earthworks at Boyd's Ferry on the north shore of the Dan. Cornwallis persisted and on February 14 finally forced Greene to cross into Virginia. Greene used some of Kosciuszko's boats and immediately took cover behind the engineer's hastily erected defenses. Without boats of his own Cornwallis reluctantly gave up the pursuit.

Greene's escape across the Dan was crucial to the survival of the American cause in the south. Cornwallis had barely withdrawn when

Greene's men began moving back across the river. Anxious to reestablish himself in North Carolina, the American general sent Kosciuszko east to Halifax on the Roanoke River with instructions to erect fortifications if they could be done quickly. The trip over bad roads through territory thickly populated with Tories was difficult, but miraculously the engineer made it in less than three days. Characteristically, Kosciuszko regretted taking so long. "As I Could not get Horses on the road, and was Obliged to go foot part of the way," he apologized to Greene, "you will be pleased to thing [think] that I have don what I Could."[32] Once at Halifax Kosciuszko wasted no time. The morning after his arrival he surveyed the town and concluded at least six redoubts would be required to defend the place adequately. As there were few entrenching tools and no militia or Negroes to do the job, he recommended against fortifications. Only the town's stores and magazines would entice the enemy to attack. So, in Kosciuszko's opinion, the best solution was to evacuate them from the town.[33]

Greene spent the next several months recapturing British outposts in the Carolina backcountry. There were victories and reverses, but by fall the enemy had been driven to the coast. As Greene asserted, "We fight, get beat, rise, and fight again."[34] Along the way Kosciuszko selected and fortified encampments and during most battles directed the erection of fortifications.

Greene's push against the British was ably assisted by men such as Lt. Col. Henry "Light-Horse Harry" Lee, commander of Lee's Legion, a corps of three troops of cavalry and three companies of infantry. Lee's *Memoirs of the War in the Southern Department* is a marvelous source for the story of the successful American campaign to win back the south. Below are excerpts dealing with the sieges of British outposts at Fort Watson, Augusta, and Ninety-Six in the period April–June 1781.

During the siege of Fort Watson in mid-April the rebels utilized a new device, a prefabricated log crib with a gun platform, known as a Maham tower after its designer, Col. Hezekiah Maham, commander of an independent South Carolina dragoon regiment. Maham was not an officer in the Corps of Engineers but his tower ranks as one of the war's significant innovations in siege works. The Maham tower, which rose above the walls of the British forts, was a very practical solution to the rebels' shortage of artillery and entrenching tools. Success at Fort Watson led to its use at Augusta and Ninety-Six.

7. A MAHAM TOWER IS USED AGAINST FORT WATSON

From Henry Lee's memoirs.

April 1781. . . . On the evening of the 15th, [Lt. Col. Francis] Marion and [Lt. Col. Henry] Lee took a position in the open country, with [Col.

John] Watson to their left, considerably below them, and on the route for the fort called by his name, which he had erected.

Determined to carry this post without delay, Marion and Lee sat down before it early in the evening; not doubting, from the information received, that the garrison must soon be compelled to surrender, for want of water, with which it was supplied from an adjacent lake, and from which the garrison might be readily and effectually secluded. In a very few hours the customary mode of supplying the post with water was completely stopped; and had the information received been correct, a surrender of the garrison could not have been long delayed. The ground selected by colonel Watson for his small stockade, was an Indian mount, generally conceived to be the cemetery of the tribe inhabiting the circumjacent region: it was at least thirty feet high, and surrounded by table land. Captain M'Koy, the commandant, saw at once his inevitable fate, unless he could devise some other mode of procuring water, for which purpose he immediately cut a trench secured by abbatis from his fosse to the river, which passed close to the Indian mount. Baffled in their expectation, and destitute both of artillery and intrenching tools, Marion and Lee despaired of success; when . . . Maham, of South Carolina, accompanying the brigadier, suggested a plan, which was no sooner communicated than adopted. He proposed to cut down a number of suitable trees in the nearest wood, and with them to erect a large strong oblong pen, to be covered on the top with a floor of logs, and protected on the side opposite to the fort with a breast work of light timber. To the adjacent farms dragoons were despatched for axes, the only necessary tool, of which a sufficient number being soon collected, relays of working parties were allotted for the labour; some to cut, some to convey, and some to erect. . . . Maham undertook the execution of his plan, which was completely finished before the morning of the 23d, effective as to the object, and honourable to the genius of the inventor. The besieged was, like the besieger, unprovided with artillery, and could not interrupt the progress of a work, the completion of which must produce immediate submission.

A party of riflemen, being ready, took post in the Maham tower the moment it was completed; and a detachment of musketry, under cover of the riflemen, moved to make a lodgment in the enemy's ditch, supported by the legion infantry with fixed bayonets. Such was the effect of the fire from the riflemen, having thorough command of every part of the fort, from the relative supereminence of the tower, that every attempt to resist the lodgment was crushed. The commandant, finding every resource cut off, hung out the white flag. It was followed by a proposal to surrender, which issued in a capitulation. This incipient operation having been happily effected by the novel and effectual device of . . . Maham, to whom the commandants very gratefully expressed their acknowledgment, Marion and Lee, preceded by the legion cavalry under major Rudolph, who had been detached on the day subsequent to the investiture of the fort, turned their attention to lieutenant colonel Watson, now advancing from below to relieve his garrison. Knowing that the fall of Camden was closely connected with the destruction of Watson, the American commandants viewed with delight his approach; and having disposed of the prisoners, moved to join the cavalry, now retiring in front of the enemy.

—Lee, *Memoirs*, pp. 218–19.

8. LEE RECOUNTS THE SIEGE OF AUGUSTA

From Henry Lee's memoirs.

May–June, 1781. The works contiguous to the [Savannah] river had advanced nearly to the required state, and those which had been subsequently commenced in the rear of the fort [Fort Cornwallis] began to assume a formidable appearance yet extreme difficulty occurred in the consummation of the plans adopted by the besiegers, as the surrounding ground presented no swell or hill which would enable them to bring their six pounder to bear upon the enemy. It was determined to resort to the Maham tower, the effect of which Lee had so happily witnessed at fort Watson; and orders were accordingly issued to prepare and bring in timber of such a size as would sustain our only piece of artillery.

Browne[35] heretofore had patiently looked on at our approach, diligently working within his fort, as we discovered by the heaps of fresh dug earth in various directions; but with what view remained unascertained. Seeing that his enemy's works were rapidly advancing, he now determined to interrupt our progress by sallies, however hazardous, which he foresaw could alone retard his approaching fate—hoping that in the delay he might find safety. On the 28th [May] he fell upon our works in the river quarter at midnight, and, by the suddenness and vigour of his onset, drove the guard before him; but the support under captain Handy coming up, after an obstinate conflict, regained the trenches, and forced the enemy to take shelter in the fort. The determined spirit manifested by the foe in this attempt to destroy our approaches, induced lieutenant colonel Lee to appropriate his infantry exclusively for their defence at night, relieving them from any further share in labour and from every other duty. It was divided into two divisions, to one of which was alternately committed the protection of our works. On the succeeding night Browne renewed his attempt in the same quarter; and for a long time the struggle was continued with mutual pertinacity, till at length captain Rudolph, by a combined charge with the bayonet, cleared the trenches, driving the enemy with loss to his strong hold. On the 30th the timber required to build the Maham tower was prepared and conveyed to the intended site. In the evening we commenced its erection, under cover of an old house to conceal our object from the enemy. In the course of the night and ensuing day we had brought our tower nearly on a level with the enemy's parapet, and began to fill its body with fascines, earth, stone, brick, and every other convenient rubbish, to give solidity and strength to the structure. At the same time the adjacent works, in the rear of the fort, were vigorously pushed to the enemy's left to connect them with the tower, the point of termination.

Browne's attention was soon drawn to this quarter; and, penetrating the use to which the log building would be applied, he determined to demolish it without delay.

[Brig. Gen. Andrew] Pickens and Lee, well assured from what had passed that their judicious opponent would leave nothing unessayed within his power to destroy their tower—on the completion of which their expectation of immediate success chiefly depended—determined to prepare before night for the counteraction of any attempt which might be made. . . . The tower was designated as the peculiar object of attention, and to its defence one company of musketry was exclusively applied. Not more than one third of the night had passed when the enemy began to move; concealing his real object by renewing his attempt upon the river quarter, where Rudolph, with his accustomed gallantry, gave him a warm reception. While the contest here was bravely urged, and as bravely sustained, lieutenant colonel Browne, with the elite of his garrison, fell upon our works in his rear. Here for awhile the militia of Pickens contended with vigour, but at length were forced by the bayonet out of the trenches. Handy, leaving one company at the tower, with his main body hastened to support the militia, who very gallantly united with the regulars, and turned upon the successful foe. The conflict became furious; but at length the Marylanders under Handy carried the victory by the point of the bayonet. Upon this occasion the loss on both sides exceeded all which had occurred during the siege. Browne, finding that every effort to destroy our works by open war proved ineffectual, now resorted to stratagem. Lee had omitted to pull down, as was originally intended, the old wooden house, under cover of which the tower had been commenced, and which by accidentally taking fire would have probably consumed it. This house attracted Browne's notice, and he determined, by burning it, to rid himself of the tower. He had by this time erected a platform in one of the angles of the fort opposite to our Maham tower, and which, being mounted with two of his heaviest pieces or ordnance, opened upon it before it was finished.

Nevertheless the exertions of the builders, did not slacken, and on the first of June the tower was completed, and was found to overlook the enemy's parapet. The upper logs having been sawed to let in an embrasure for our six pounder, it only remained to make an apron upon which the matrosses[36] could draw up their piece to the floor of the tower.

This was done in the course of the day, and at dawn on the second our six pounder was mounted, completely commanding the enemy's fort. Finley instantly announced his readiness to act by returning the enemy's cannonade, which had been continued without intermission. Before noon the enemy's two pieces were dismounted from the platform, and all the interior of the fort was raked, excepting the segment nearest to the tower, and some other spots sheltered by traverses.

—Lee, *Memoirs*, pp. 243–45.

In laying siege to Ninety-Six, Greene relied on the advice of Kosciuszko. The engineer's decision to concentrate the rebel effort against the star redoubt—the enemy's strong point—met with sharp criticism from Lee, who felt it was more realistic to cut off the town's water supply by seizing nearby Fort Holmes. Despite this major disagreement, Light-Horse Harry conceded that Kosciuszko was "considered skilful in his profession, and much esteemed for his mildness of disposition and urbanity of manners."

As the siege wore on and the enemy garrison appeared on the verge of receiving reinforcements, Lee deplored Kosciuszko's failure to attack the enemy's left. Had he done so earlier, Lee believed, the enemy, deprived of water, would already have surrendered. Kosciuszko, on the other hand, maintained that he did not have enough men to lay siege to the enemy's left and right simultaneously, so "we thought proper to begin against the Star redoubt." The engineer offered no further explanation for the choice. Finally Lee personally directed a successful assault against Fort Holmes, but it proved too late.

All along the enemy's best hope was for fresh troops. When relief finally appeared within striking distance on 18 June 1781 Greene reluctantly agreed to storm the fort after "his soldiers, with one voice, intreated to be led against [it]." As described by Lee, the attack failed and Greene abandoned the siege.

The following accounts of the siege by Lee and Kosciuszko emphasize the disruptive effect of repeated enemy sorties against the rebel works. Indeed, the first night's accomplishments were immediately destroyed. During another British sally the night of June 9, the enemy surprised Kosciuszko while he inspected a mine shaft he was building near the star fort. Luckily the engineer escaped with only a wound.[37]

9. KOSCIUSZKO "PRESSED FORWARD HIS APPROACH WITH INDEFATIGABLE LABOUR"

From Henry Lee's memoirs.

Colonel Kosciusko, a Polish officer, at the head of the engineers in the southern army, was considered skilful in his profession, and much esteemed for his mildness of disposition and urbanity of manners. To this officer general Greene committed the designation of the course and mode of approach. Never regarding the importance which was attached to depriving the enemy of water, for which he depended on the rivulet to his left, Kosciusko applied his undivided attention to the demolition of the star, the strongest point of the enemy's defence. Breaking ground close to this fortress,[38] he laboured during the first night [21 May 1781] with diligence, but had not been able to place in great forwardness his incipient works. No sooner was this attempt of the besieger perceived, than lieutenant colonel Cruger[39] determined to prepare a platform in one of the salient angles of the star, opposite to our works, for the reception of three pieces of artillery, all he possessed, with intention to cover a detachment charged with the expulsion of our working parties, to be followed by a second for the demolition of the works. Before noon the platform was finished, and the artillery mounted in it. The parapet was manned with infantry; and the sallying party . . . ready in the enemy's ditch, rushed upon our works, covered by the artillery and musketry. [Lt. Col. John] Roney drove before him our guards and working parties, putting to the bayonet all whom he found; and was followed by a detachment of loyalists, who quickly demolished the works, carrying off the intrenching tools. The enemy sustained no loss in this first exhibition of his decision and courage, but that of lieutenant Roney, who died of a wound he received while gallantly leading on his men.

So judiciously was this sally planned, and so rapidly conducted, that, although Greene instantly sent a detachment to support Kosciusko, the object was accomplished before support could arrive. Taught by this essay that his enemy was of a cast not to be rashly approached, Kosciusko was directed to resume his labours under cover of a ravine, and at a more respectful distance [400 yards]. He broke ground again in the night of the 23d, still directing his approaches against the star redoubt. . . .

General Greene had exerted himself, with unremitting industry, to complete the works against the star redoubt; to which single object colonel Kosciusko directed all his efforts. The enemy's left had been entirely neglected, although in that quarter was procured the chief supply of water. As soon as the corps of Lee entered camp [8 June], that officer was directed to take post opposite to the enemy's left and to commence regular approaches against the stockade [Fort Holmes]. Very soon Lee pushed his ditch to the ground designated for the erection of the battery, under the cover of which the subsequent approaches would be made. In the course of the next day this battery was erected, and lieutenant Finn, with a six pounder, took possession of it. The besiegers advancing closer and closer, with caution and safety, both on the right and left, lieutenant colonel Cruger foresaw his inevitable destruction, unless averted by the approach of lord Rawdon.[40] To give time for the desired event, he determined, by nocturnal sallies, to attempt to carry our trenches, and to destroy with the spade whatever he might gain by the bayonet. These rencontres were fierce and frequent, directed sometimes upon one quarter sometimes upon another: but so judicious had been the arrangements of the American general to counteract these expected attempts, that in no one instance did the British commandant succeed. The mode adopted was nevertheless pursued without intermission; and although failing to effect the chief object contemplated, became extremely harassing to the American army,—whose repose during the night was incessantly disturbed, and whose labour in the day was as incessantly pressed. Ignorant of the situation and prospects of the British general as lieutenant colonel Cruger continued to be,[41] he nevertheless indulged the confidence, that every effort would be made for his relief, and persevered with firmness and vigour in his defence. As soon as the second parallel was finished, general Greene directed colonel [Otho Holland] Williams, adjutant general, to summon the British commandant; stating to him his relative situation, and assuring him that perseverance in resistance would be vain, and might produce disagreeable consequences to himself and garrison. Cruger returned, by his adjutant, a verbal answer; declaring his determination to hold out to the last extremity, and his perfect disregard of general Greene's promises or threats. Failing in this attempt, our batteries opened from the second parallel, under cover of which Kosciusko pressed forward his approach with indefatigable labour. . . .

Our approaches continued to be pushed with unabated diligence, in the hope that they might be brought to maturity in time to enforce the submission of the garrison, before the British general could make good his long march.[42]

We now began to deplore the early inattention of the chief engineer to the enemy's left; persuaded that had he been deprived of the use of the rivulet in the beginning of the siege, he must have been forced to surrender before the present hour. It was deemed practicable to set fire to the stockade fort, and thus to demolish the water defence on the left of the rivulet. In the succeeding day, a dark violent storm came on from the west, without rain. Lieutenant colonel Lee proposed to general Greene to permit him to make the attempt. This being granted, a sergeant with nine privates of the legion infantry, furnished with combustible matter, was directed to approach the stockade in the most concealed direction, under cover of the storm, while the batteries in every quarter opened upon the enemy, and demonstrations of striking at the star redoubt were made, with the expectation of diverting his attention from the intrepid party, which, with alacrity, undertook the hazardous enterprise. The sergeant conducted his gallant band in the best manner; concealing it whenever the ground permitted, and then exposed to view crawling along upon the belly. At length he reached the ditch with three others; the whole close behind. Here unluckily he was discovered, while in the act of applying his fire. Himself and five were killed; the remaining four escaped unhurt, although many muskets were discharged at them running through the field, before they got beyond the nearest rise of ground which could cover them from danger. After this disappointment, nothing remained but to force our works to maturity, and to retard the advance of the British army. . . .

. . . Major Greene, who commanded in the star with great ability, finding that our third parallel was nearly finished, and that a Maham tower was erecting which would overlook his parapet, very judiciously covered it with sandbags, to lessen the capacity derived from superior height, leaving between each bag an aperture for the use of his riflemen. Nor were the approaches on the left less forward than those on the right; they not only were directed against the stockade, but also were carried so near the rivulet, as to render supplies of water difficult and precarious. The fire during the 17th was so effectual, as to induce the enemy to withdraw his guards established between the rivulet and the stockade; and parties of the troops on the left were posted in various points, to annoy the communication with the rivulet. These arrangements succeeded throughout the day completely, and the enemy suffered greatly from this privation, though accomplished too late to produce material advantage. Rawdon continued to advance by forced marches . . . .

. . . [Rawdon] baffled all the measures adopted by Greene to delay his approach. It now became necessary to hazard an assault, to meet Rawdon, or to retire. The American general was disposed to immitate Caesar at Alesia; first to beat the relieving army, and then to take the besieged town. But his regular force did but little exceed the half of that under Rawdon, which added to his militia, consisting of the corps of Sumter, Marion, and Pickens, still left him numerically inferior to the British general. Nevertheless confiding in his known superiority of cavalry, he would have given battle to his lordship, could he have left an adequate corps to attend to the garrison. Compelled to relinquish this plan, he determined to storm the fort, although his works were yet unfinished. On our left, our third parallel was completed, two trenches and a mine were nearly let into the enemy's ditch, and the Maham tower was finished.

On our right, the trenches were within twenty yards of his ditch; and the battery directed by lieutenant Finn, gave to the assailant, in this quarter, advantages which, well supported, ensured success. Greene, anxiously as he desired to conclude his severe toils in triumph, was averse to the unequal contest to which he must necessarily expose his faithful troops, and would probably have decided on the safe course, had not his soldiers, with one voice, intreated to be led against the fort. The American army having witnessed the unconquerable spirit which actuated their general, as well as the unexpected results of former battles, could not brook the idea of abandoning the siege, without one bold attempt to force a surrender. . . . Orders were issued to prepare for storming; and the hour of twelve on the next day (18th June) was appointed for the assailing columns to advance by signal from the centre battery.

. . . Fascines were prepared to fill up the enemy's ditch, long poles with iron hooks were furnished to pull down the sandbags, with every other requisite to facilitate the progress of the assailant. At eleven the third parallel was manned, and our sharp shooters took their station in the tower. The first signal was announced from the centre battery, upon which the assailing columns entered the trenches; manifesting delight in the expectation of carrying by their courage the great prize in view.

At the second cannon, which was discharged at the hour of twelve, Campbell and Lee rushed to the assault. Cruger, always prepared, received them with his accustomed firmness. The parapets were manned with spike and bayonet, and the riflemen fixed at the sand bag apertures, maintained a steady and destructive fire. [Lt. Isaac] Duval and [Lt. Samuel] Seldon entered the the enemy's ditch at different points, and [Col. Richard] Campbell stood prepared to support them, in the rear of the party furnished with hooks to pull down the sand bags. This party had also entered the enemy's ditch, and began to apply the hook. Uncovering the parapet now would have given us victory; and such was the vigorous support afforded by the musketry from the third parallel, from the riflemen in the tower, and from the artillery mounted in battery, that sanguine expectations of this happy issue were universally indulged. The moment the bags in front were pulled down, Campbell would have mounted the parapet, where the struggle could not have been long maintained. Cruger had prepared an intermediate battery with his three pieces, which he occasionally applied to right and left. At first it was directed against Lee's left, but very soon every piece was applied upon Campbell's right, which was very injurious to his column.

Major Greene, commanding in the star redoubt, sensible of the danger to which he was exposed, if the attempted lodgment upon his front curtain succeeded, determined to try the bayonet in his ditch as well as on his parapet. To captains Campbell and French was committed this bold effort. Entering into the ditch through a sally-port in the rear of the star, they took opposite directions, and soon came in contact, the one with Duval, the other with Seldon. Here ensued a desperate conflict. The Americans, not only fighting with the enemy in front but with the enemy overhead, sustained gallantly the unequal contest, until Duval and Seldon became disabled by wounds, when they yielded, and were driven back with great loss to the point of entry. The few surviving escaped with the hookmen to our trenches, where yet remained Campbell, the sand-bags not being removed. On the left, the issue was very different. Rudolph gained the enemy's ditch, and followed by the column, soon opened his way into the fort, from which the enemy, giving their last fire, precipitately retreated. Measures were in train on the part of Lee, to follow up his blow by passing the rivulet, entering the town, and forcing the fortified prison, whence the left might have yielded substantial aid to the attack upon the star, by compelling Cruger to struggle for the town, or forcing him with all his troops to take refuge in the star; a situation not long to be held, crowded as he must have been, and destitute of water. The adverse fortune experienced by our left column, made the mind of Greene return to his cardinal policy, the preservation of adequate force to keep the field.

Charmed with the courage displayed in his view, and regretting its disadvantageous application, he sent orders to Campbell to draw off, and to Lee to desist from further advance, but to hold the stockade abandoned by the enemy.

Our loss amounted, during the siege, to one hundred and eighty-five killed and wounded; that of the garrison to eighty-five. . . .

. . . Gloom and silence pervaded the American camp: every one disappointed—every one mortified. Three days more, and Ninety-Six must have fallen; but this short space was unattainable. Rawdon had approached our vicinity with a force not to be resisted, and it only remained to hold the army safe, by resuming that system which adverse fortune had rendered familiar to us. Greene alone preserved his equanimity; and, highly pleased by the unshaken courage displayed in the assault, announced his grateful sense of the conduct of the troops, as well during the siege as in the attack; presaging from the past, the happiest result whenever an opportunity should be presented of contending with the enemy upon equal terms—to the attainment of which his best exertions would be invariably directed, relying, as he did, upon the same dauntless spirit recently exhibited. Conscious as the army was of having done its duty, it derived consolation from this exhilarating address, and burying in oblivion the grating repulse, looked forward with the anticipation of soon displaying their courage in a decisive battle.

—Lee, *Memoirs*, pp. 240–42, 252–57.

10. "BLIND FORTUNE NOT ALWAYS KEEP PACE WITH CURAGE AND GOOD CAUSE"

Thaddeus Kosciuszko's notes on the siege of Ninety-Six.

[Viewing] the Enmys Works on every side, . . . it apperd that the Star Redoubt upon our left was the Strongest post, not only by been Complitly finished but that Comanded the others two to our right one in which the Town was inclosed distant at one Hundred and fifty yards and situated near the water and the other smal more upon our right at Three Hundred and fifty yards. Thos all three redoubts had Comunication with each other by Coverd way. . . . Not strong enogh to capture the trenches to our left and wright at the same time against the Garison of about 500 strong we thought proper to begin against the Star redoubt. . . .

Accordingly the same night [21 May 1781] the battery was made with two fleches to suport it at one hundred and fifty yard from the Star redoubt, but as the troops were novice to the operation of that kind and begon in the night far advanced it was not Complited at a break day to bring the Canon Pices . . . . The Ennemys vigilant took the advantage and in the morning at 9 Clock made in considerable nomber the Sallies suporting it by the musketery and Artillery from the Fort. . . .

On the 27 of May in the night the Battery was made at 220 yards distant with the aproches of Thirty yards farther—[here] the Workmen began to be exposed to the Continuel of the Enemys fire all night and the [succeeding] but, more danger forseen, was imediatly conteracted by more Exertions of the Troops.—As the Nature of the Ground was very hard and aproched very much to Soft Stone the Approches Could not be so fast adwancd.

On the 30th of May the Parallel was half done at one Hundred and fifty yards and [here] the Second Sallies the Enemys made but with small effect—Three or four men of both side were killed. The militia now began come very fast from the adjacent Countys, which gave oportunity to [open] the Trenches against the smal Redoubt [Fort Holmes] mention(ed) upon our right—And the same day the Battery was made at 250 yards with the aproches of 70 yards more advanced.

The 4th of the June upon our left the parallel Complited, the Battery was made at 180 yards . . . with the fleche 30 yards more adwanced and the same day in the night the Enemys Trow down the roofs of the houses in the Town and in the Star redoubt and made the Sallies suporting with Canon from the work upon our left with no other Sucess then to cut down the mantelet wich there was posted to Cover the workmen from Rifle shot and [quiet] them (the British) if possible by ours.

The Next day upon our left we desmount the Canon in the star Redoubt from the Battery and killed few men in it.

The 6 we [heightened] our Battery Station to 20 feet which oblidge the Ennemy to intrenche inside half way with the parapet of sixteen feet high.—We adwanced the aproches but very little and Complit the paralell upon our left at 120 yards. . . .

The same night [June 9] The Ennemys made Sallies with prodigous fury and killed 4 or 5 men,—on the 12 upon our left the aproches begon from two places of the Paralell, in side of which the Rifle Battery also begon to stop the Ennemys Riflem(en) who were so industrious and great marksmen that no finger wold be held up half second without been Cut of.

On the 14th the Rifle Battery Complited 30 feet high, the Gallery adwanced 30 yards and the aproches 20 yards and on our left 40.—On the 16 the Battery was made upon our left.—The Gallery was near to four feet of the Ennemys Dich and the Approches 6 feet.—On the 17th the General reciving the last account of Lord Rawdon coming with 2000 men to relieve the Garison of Ninety Six and been sonear that would oblidge us rise the Siedge the next morning. Thoght prudent to try the ardor and enxiaty of the Troops by the attack upon both redoubts—number of Officers and soldiers hearing the intention of the General present(ed) self as Wolunteers. But happy lot fell upon few—at 9th Clock in the morning the attack begon—blind fortune not always keep pace with Curage and Good Cause—Colo Lee' upon our right took posesion of the smal redobt with very small loss.—But Colo. Campbell upon our left was unsuccessful in this attact—Capt Amstrong and 30 soldiers were killed of which Valor intrepidy left us Chearish their memory, regret the loss and bring the Example to posterity.

—Haiman, *Kosciuszko*,
pp. 111–14.

Greene's troops rested for several weeks after the retreat from Ninety-Six but resumed the offensive in August. In September, at Eutaw Springs, South Carolina, Greene fought and lost his last major battle. Yet the British army was so weakened that ultimate American victory seemed only a matter of time. Although the redcoats held on at Savannah until July 1782 and at Charleston until the following December, Cornwallis's defeat at Yorktown in October 1781 (discussed in detail in the following chapter) only left Greene the task of countering the enemy's continued yet hopeless resistance.

Throughout 1782 Kosciuszko remained with Greene, serving more often as an officer of the line than as an engineer. For a while he commanded a post at Ashley Ferry, where he observed enemy movements at Charleston. His duties included acting as an intermediary between Greene and the patriot community in British-occupied Charleston. Kosciuszko proved himself a competent commander. In November he led a surprise attack on enemy troops as they cut wood outside Fort Johnson at the entrance to Charleston harbor. This skirmish was a heated affair. His coat torn by cannonballs, Kosciuszko narrowly escaped injury.

After the British evacuation of Charleston in December 1782 Kosciuszko stayed with Greene until spring 1783. A warm friendship had developed between them. As Kosciuszko left the Southern Department Greene expounded on the engineer's "attention, vigilance, and industry" in war. Greene found Kosciuszko to be a man "whom no pleasure could seduce, no labor fatigue, and no danger deter." Above all, in Greene's view, his chief engineer possessed "an unparalleled modesty and entire consciousness of having done anything extraordinary."[43]

Chapter IX

YORKTOWN: THE GRAND SIEGE, 1781

After Virginians drove out their last royal governor in the summer of 1776, virtually no military action occurred in the state for three years. Still, Virginia was very important to the American cause as a supplier of men, materiel, food and tobacco, a great source of credit in trade with Europe.

Recognizing Virginia's importance, the British tried to weaken her position as soon as they had the manpower. In May 1779 British Maj. Gen. Edward Mathew conducted successful raids in the area surrounding Portsmouth and Norfolk. Then in December 1780 Brig. Gen. Benedict Arnold raided plantations along the James River. On 5 January 1781 Arnold capped his first assignment since deserting the rebels by capturing Richmond. State authorities were helpless to prevent these strikes, and as a result many valuable stores were destroyed.

Virginia presented a real problem for the British. Control of the state was obviously important, but other regions seemed even more crucial. Indeed, Generals Henry Clinton and Lord Cornwallis disagreed sharply over what should be done. Cornwallis wanted troops—detached from New York City if necessary—to start an immediate offensive in Virginia. On the other hand, the cautious Clinton refused to jeopardize New York. He wanted Cornwallis to exercise restraint until much-needed reinforcements arrived from Britain.

Clinton had reason for concern. In the spring of 1781 a major campaign in Virginia was far from General George Washington's mind. Instead, as he had ever since the painful loss of the city in 1776, Washington dreamed of recapturing New York. But both Chief Engineer Louis Duportail and the Comte de Rochambeau, the commander of the French forces dispatched to Newport the previous summer, were unenthusiastic about Washington's plans. For several weeks in March Duportail met with Rochambeau at Newport, where they discussed at length the plan to attack New York. In the following memorial to Washington, Duportail clarified his position on a New York offensive and advocated instead one against Charleston.

In Duportail's view success at New York depended on the fulfillment of several basic conditions: the enemy must not receive reinforcements, Admiral de Grasse must control the waters around New York, and the besieging army must outnumber the enemy by at least three to one. Confident that the Americans could be masters of the harbor at Charleston, Duportail recommended that "as soon as it is determined that we cannot undertake any thing against New York, we must embark all the French Troops and as many of the Americans as can be spared . . . and go . . . directly to Charlestown." Evidently he was alone in urging such a move. As plans to take New York progressed, he does not appear to have pressed the issue further.

1. DUPORTAIL ADVOCATES A CHARLESTON OFFENSIVE

Memorial of Louis Duportail to George Washington.

[March 1781]

. . . If it is determined that Count De Grasse cannot force the Hook [Sandy Hook], but if he is master of those Seas, I suppose 'till November when he must go to the West Indies, it is asked in what case we may attack New York.

I think that if the British at New York have not received any Reinforcement from Virginia and if Count De Grasse brings 4000 men with him we may undertake to attack New York, to speak more generally, to attack New York in the case mentioned here, I would have no less than thrice the number of Men which we suppose that the Enemy have, because the time for the siege is determined and if we don't succeed, we lose all our advantages we could get in other quarters. . . .

Let us suppose now, that the circumstances do not permit to attempt any thing against New York, then we must consider these two cases.

Either the Enemy shall have evacuated Virginia entirely or they shall have left a Garrison in Portsmouth.

If the Enemy have evacuated Virginia entirely, I suppose they have made this distribution of their Troops, they have sent 3000 Men to New York and 12,000 to Charlestown. I suppose besides, that Lord Rawdon has now 3500 and that in case of an Attack, the British may collect 1500 Militia that will make 8000 Men in all. Is it advisable to undertake something against Charlestown so Garrisoned?

I answer that we have here a circumstance like that at New York. I mean that the harbour may be *forced*, and that by the local circumstances, after you have forced it, you may Stay in it as long as you please. Although not in possession of the Town, so that with a moderate number of Troops you can reduce it by Famine, if not by force.

I cannot say what difficulty we could meet now in the attempt for forcing the bar; but I observe we must observe it cannot be defended by land Batteries, it must be defended only by Armed Ships, Frigates, floating Batteries, Gallies, etc. When I was Prisoner near Charlestown, I heard the British had only sometimes one two or three small Frigates at most, with one or two Gallies for that purpose; if it is the case now, I think that it should be very easy to force the *bar* with four or five large Frigates, or better, one or two 44 Gun Ships. Admiral Arbuthnot,[1] in one of his Letters to Lord Germaine,[2] says there are 19 feet of Water upon the bar at high tide. I think this is enough for a 40 Gun Ship. After you have forced the bar and entrance of the Harbour, you may introduce two or three fifty Gun Ships in it and then I believe you could brave all the attempts of the Enemy to get in again, so the whole fleet of Ships of the line may go where they are more necessary.

When we are perfectly Master of the Harbour of Charlestown, we then may choose either to attack it, or to block it up according to our means and strength.

To block it up, I think 7000 Men are enough on the Land side between James and Ashley Rivers, because we may fortify them if necessary. The quantity of Troops we must have on James's Island, and on the other sides of Cooper and Ashley, either for the greater security of our Fleet or from hindering the Enemy from getting Provisions, it depends upon this how far up the Ships have been able to penetrate into the Harbour and the Rivers (because the Enemy can make obstructions in some places, but in the most advantageous case, I think 4000 Men part of which may be Militia shall fill our object.

So I think that with 1100 [11,000?] Men we can block Charlestown up entirely.

To attack it I would have at least 4000 More.

A difficulty occurs, is it possible to supply with Provisions, so large a number of Men in that Quarter.

I believe it is, if the Expedition takes place, it will be before the Rice is cut, so that we can get plenty either in Carolina or Georgia, where we may send a body of Troops for that purpose.

Besides, I observed already that after we are in possession of the Harbour, the Fleet may go away. I suppose it will go to Chesapeak; so far they shall cover perfectly well the Transportation of our Supplies. If Count De Grasse is obliged, in the beginning of November to return to the West Indies, I do not doubt he will leave a fleet Superior or at least equal to that of the Enemy, so that our Convoys shall be safe; besides, we know that from Chesapeak to Charlestown, there is between the Main and some Islands an interior Navigation which may render the transportation very easy. It is only necessary to have for that purpose some small Armed Vessels to protect them against Privateers. So I think that on account of the importance of the Capture of Charlestown this year, as soon as it is determined that we cannot undertake any thing against New York, we must embark all the French Troops and as many of the Americans as can be spared with plenty

Provisions, etc., and go, under the protection of the whole fleet, directly to Charlestown. . . .

—Washington Papers, roll 26.

In April 1781 Washington sent the Marquis de Lafayette to Virginia with a force including some of the sappers and miners. Washington intended Lafayette to stop Arnold's raids, but the operation was clearly secondary. Meanwhile on May 22 Washington met Rochambeau at Wethersfield, Connecticut, to discuss the long-awaited joint effort to crush the enemy. At Washington's insistence their talks focused on plans to retake New York City.

Washington knew beforehand that both his Chief Engineer and the French commander were not eager for an attack on New York. Nevertheless Washington included Duportail in the day-long discussions with Rochambeau. The Commander in Chief evidently had great confidence in his ability to win the two Frenchmen over. More importantly Washington valued Duportail's knowledge of the enemy position in New York, his proven ability to evaluate the rebels' strength, and his camaraderie with fellow French officers like Rochambeau. The Chief Engineer was a valuable asset indeed.

When the conference ended Rochambeau tentatively approved Washington's plan. Soon Washington got word of new monetary assistance from the French government. Now everything seemed to be in readiness. On May 28 he instructed Duportail to estimate the engineering department's needs for conducting a siege. In a matter of days the Chief Engineer responded. His evaluation includes a rare calculation of the manpower and time required to make some of the principal instruments of siegecraft—gabions, saucissons, and fascines.

2. DUPORTAIL'S ESTIMATE OF REQUIREMENTS FOR A NEW YORK SIEGE

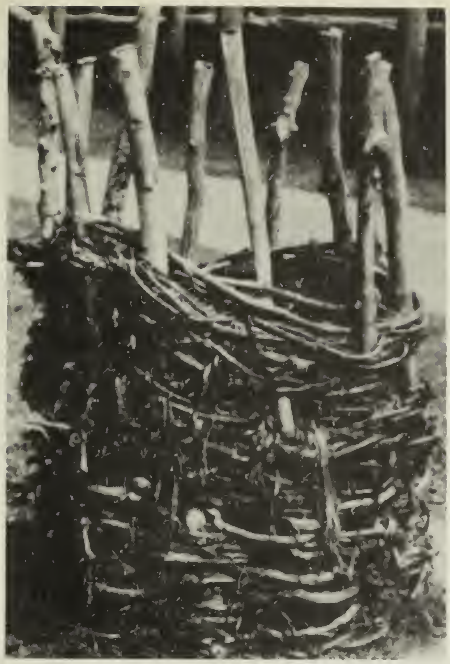
New Windsor, June 2, 1781

Planсks for platteformes about 12 inches broad and 2 inches thick.

I make amount to 150 the number of Cannons of different Caliber and mortars which we Can get and which are necessary whether to batter the ennemy's lines on new york island or long island or to secure the Communications and some other things.

We must observe that the french army must be provided by us with the following articles.

Each piece Requires about 200 feet of plancks; for 150—30,000 feet. Saucissons (large fascines) for the batteries—72,000 feet. Gabions for



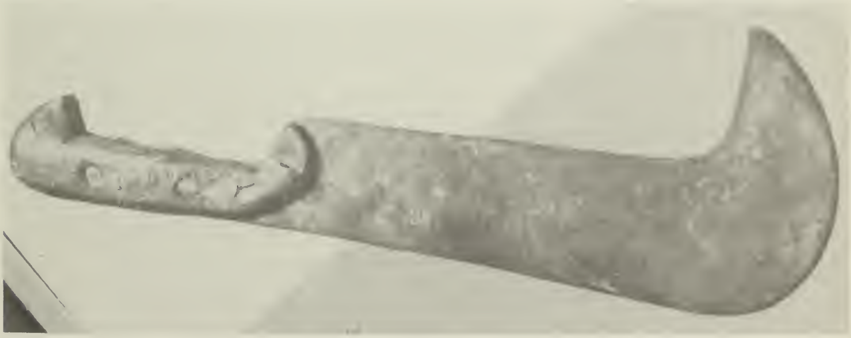
A GABION. *This replica of a gabion stands behind the restored American lines at Saratoga National Battlefield Park.*

batteries or trenches—4000 gabions. Fascines for the same—10,000 fascines.

The proportions of these things will be given to the officer appointed to superintend their Construction.

A man Can make a gabion in one day, so 500 men will make the 4000 gabions in 8 days.

A man Can make 36 feet of saucisson in one day, so 500 men will make the number Required in 3 days.



FASCINE KNIFE. *Sappers and miners used knives of this type to cut twigs and branches for fascines.*

Peterson, *The Book of the Continental Soldier*

500 men will make the 10,000 fascines in 6 days.

Sand bags—30,000. We shall probably want some more but I have been told the french army have 60 thousand.

Tools: Shovels—5000; Pick axes—2500; Axes—1200; Bill hooks—800. If the french army had no[t] enough for them, we must have more than it is Required here.

—Washington Papers, roll 78.

Late in June Washington readied his army for the strike on New York. Giving his commander the technical advice now expected of a good Chief Engineer, Duportail reconnoitered the enemy's works on northern Manhattan Island with Washington. On July 6 Rochambeau's army joined Washington at Dobb's Ferry, New York. Further reconnaissance of the enemy's works confirmed that a formal siege would be necessary. Timing, manpower, and the tools to carry out a siege were crucial considerations. The sappers and miners were busy making fascines and gabions and frequently helped the engineers with reconnaissance.[3]

On July 27 Duportail laid out the final plan for taking New York. He counted heavily on support from the French fleet, yet he judged success was possible without the fleet "if we have many troops and much time." Duportail was thinking in terms of twenty thousand men.[4]

3. DUPORTAIL'S PLAN FOR A NEW YORK OFFENSIVE

July 27, 1781

If one considers the nature of the ground in the northern part of the island of New York it will be recognized I think, that it will not be a very difficult thing to take a position on the other side of devil's [Spuyton Duyvil] creek; batteries can be established on the mountain on that side strong enough to soon force the enemy to abandon Fort Charles and after that we will be masters of Kingsbridge. The works on Cox hill are of small account by themselves and can easily be taken sword in hand. If however the enemy were to remain, after the evacuation or the taking of Fort Charles, which I do not think likely, the feeble state in which they leave the fort on Cox hill shows they do not intend to defend that part of the island, and that their veritable defense front is from Laurel hill to fort Tyron [Tryon].

Let us suppose that we are masters of Kingsbridge and have taken post on the other side, let us now see how we can progress. Considering the slope of the ground beyond forts Laurel hill and Tyron, its rocky nature, and the position between themselves . . . I do not think it practicable to attack them. . . . Doubtless, going at it properly it might succeed

> but it is hazardous, so I would prefer the following manner to establish ourselves—which is to go by boats across the Harlem river and boldly take a position between New York and Fort Washington at a place impossible to determine before arriving on the island.
>
> . . . Two things must be considered—whether we will have a French fleet in the Sound, or whether we will not. In the first place we need not fear to be troubled in the Harlem by vessels, galleys or armed boats of the enemy; we will have a much greater number of boats to transport our men; we can choose the place of debarkation upon a very much wider extent of ground; we will have fewer troops to oppose us; because the enemy will not be able to spare those on Long Island or even at New York. Success therefore seems to me very probable—it is much less so assuredly in the second case—that of not having a french fleet in the sound but it does not seem to me impossible even then, if we have many troops and much time.
>
> **—Kite, *Duportail*, pp. 201–02.**

By the time Duportail delivered his plan to Washington, he realized that disappointing news had already reached the Commander in Chief. Given a choice of destinations by Rochambeau, Admiral de Grasse had chosen the Chesapeake Bay for a joint operation against the British. Washington took immediate steps to shift the campaign to Virginia. Time was of the essence. Not only had de Grasse chosen the far-off Chesapeake for his battleground, but he had also made known his intention to sail back to the West Indies in less than three months!

As Washington made new arrangements, Duportail had words of caution. "Is it not advantageous to pursue the preparations for the attack on New yourck," he advised, in order "to deceive our army *et* so the enemy . . . if the enemy perceived we give up the idea of attacking New York they will reinforce portmouth Virginia, may be before we can get there."[5] Washington followed Duportail's advice. Before going south, he had his men march through New Jersey as if heading for Long Island. He also left Maj. Gen. William Heath in the New York area to feign further siege preparations and protect West Point.

With incredible speed Washington's 2,500 Continentals and Rochambeau's entire army marched south. Washington reached Philadelphia before the end of August, Head of Elk on September 6, and the Virginia peninsula on the 14th.

On the way south the sappers and miners stopped in Philadelphia for several days "proving and packing off shells, shot, and other military stores." While in Philadelphia they received shirts, overalls, and stockings, and each got a month's pay in specie. Sgt. Joseph Plumb Martin recalled the men's amazement: "This was the first that could be called money, which we had received as wages since the year '76, or that we ever did receive till the close of the war, or indeed, ever after, as wages."[6] The gesture could only have helped to encourage the sappers and miners to give their best to the coming campaign. And they did just that.

To facilitate the concentration of the French and American forces against the British in Virginia, Washington gave his two top-ranking engineers special assignments. He dispatched Duportail to alert de Grasse that the allied forces were coming, and he sent Lt. Col. Jean Baptiste de Gouvion to join Lafayette in Virginia.

The Chief Engineer caught up with de Grasse's flagship at the mouth of the Chesapeake. With more than three thousand ground troops under his command, de Grasse had been planning an immediate attack on Cornwallis at Yorktown while the British general was still relatively unprepared. The meeting with Duportail on board the *Ville de Paris* changed his mind. Because he had known Duportail's reputation for years, de Grasse told Washington, "I have not hesitated to open my heart to him and acquaint him with all my resources and my orders."[7] When their first exchange ended, de Grasse acknowledged that because of Washington's letter and Duportail's advice, "I have suspended my plans until the arrival of the Generals [Washington and Rochambeau], whose experience in the profession of arms, knowledge of the country and insight will greatly augment our resources."[8]

Duportail made his own report on the meeting with the French admiral. Although he recognized the difficulties in making so vast a combined operation succeed, Duportail believed this was the last opportunity "of undertaking something serious" in the south. He advised that the rebels' chances would be best if they prevented the enemy from getting provisions, thereby starving them out. His confidence in the "intelligence and good sense" of Lafayette was marked.

4. "WE MUST TAKE CORNWALLIS OR BE ALL DISHONOURED"

Louis Duportail to George Washington

Cape henry, on board ville de Paris
2 Sept 1781

Dear general:

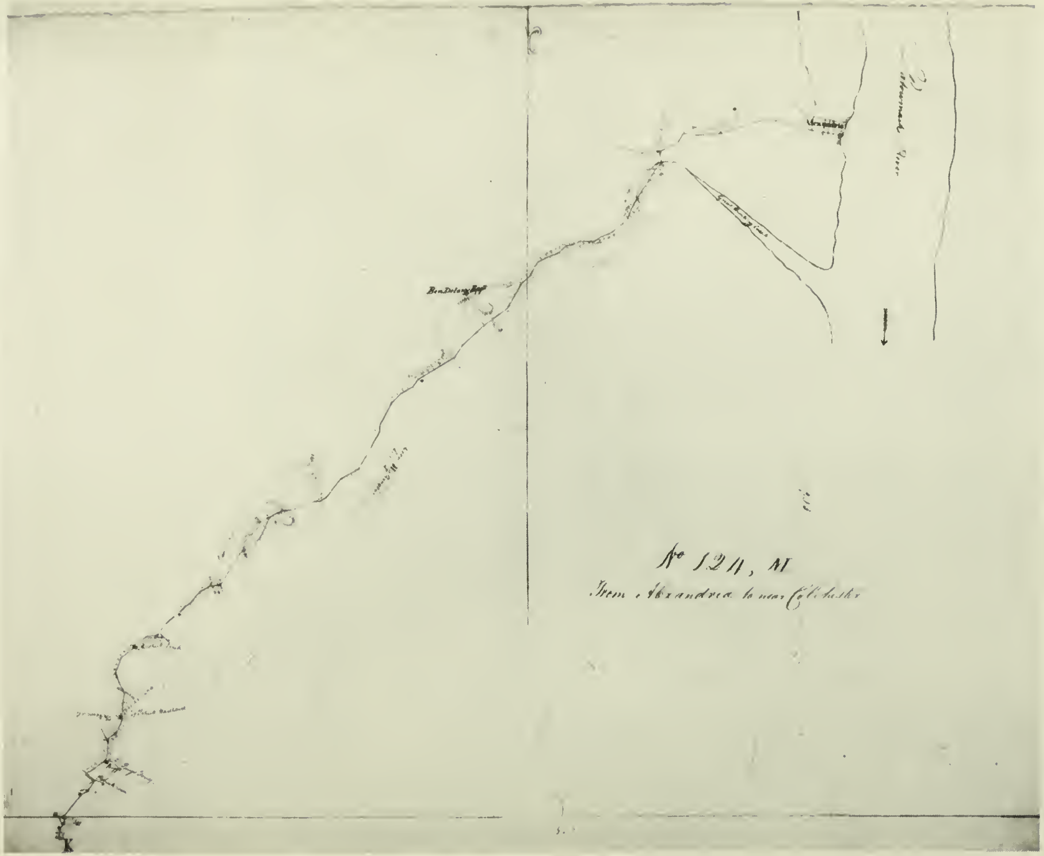
I arrived here this morning at five o'clock after a long and tedious journey on many accounts. But the pleasure I have to see at last a french fleet of 27 sail of line in Your country makes me forget all the hardships I experienced. Something yet gives me some uneasiness. I am sorry not to find here admiral du barras.[9] Your excellency knows very well all the different inconveniency's which were according to my opinion in his stay at newport. Now I am afraid he shall not be able to get away. Long while ago the british must know that the general rendevous is in the Chesapeak. So they do'nt apprehend anything at new york from Count de grasse's fleet. . . . Count de grasse being obliged to it appears to be always determined to leave us in the time announced so we have only six weeks to operate. Unfortunately he cannot provide you with vessels for the transportation of your troops and the french army, at least in this moment. And if Count de barras does not arrive, your excellency must not expect any other succor in that respect from the presence of the french fleet in the bay but the safe navigation of the vessels collected at baltimore and other places. The enemy have no vessels out of york River. That is entirely blocked up.

I intend to join too morrow the marquis [Lafayette]. The admiral has sent him already the troops he had on board which amount to more than 3000 men. Now the situation of the marquis appears to me very nice, because on one side he must not according my opinion run any great risque till you arrive. That should be entirely improper unless the ennemy gives a fine opportunity of an attacking against him which never must be lost. But in another respect it should be very advantageous to confine the enemy as much as possible that he could not collect provisions because by what I heard of the advantage of his position at york, 6000 men well fortified shall be forced with difficulty. So if we could join *famine* to other means, we should have better chance of succeeding. But to determine to what degree it is convenient to aim at each of these different objects requires a very great jugment. Fortunately the intelligence and good sense of the marquis must give us great confidence. I will put myself under his orders and second his views as much as I shall be able. But dear general come with the greatest expedition. Let us make us[e] of the short stay of Count de grasse here. We have no choice left, I thinck. When 27 of line[10] are in Chesapeak, when great americain and french forces are joined, we must take Cornwallis or be all dishonoured. Always sorry that for want of proper measure taken at distance and on account of many circumstances we cannot thinck of undertaking something serious to the southern after this will be over.

[P.S.] in case that admiral du barras should arrive as most of his transports are large ships, it would be advantageous that your troops or stores be at baltimore instead of *head of elk,* because large ships can go up there.

—***Correspondence of Washington and de Grasse,*** **pp. 12–14.**

On September 2, when Washington dispatched Gouvion to join Lafayette, he gave him special instructions. Worried about the roads his

No 124, M
From Alexandria to near Colchester
Potowmack River
Alexandria
Ben Dulany Esqr

troops and supplies would travel to the Virginia peninsula, Washington ordered the engineer to follow a specific route and report on road conditions, particularly any required repairs. "If you could incite the inhabitants as you passed along to set about this necessary business," Washington instructed him, "it would facilitate the movement of our waggons etc. which must go by land greatly."[11]

Gouvion went by land from Baltimore to Elkridge Landing and then on to Bladensburg, Georgetown, and Fredericksburg. He arrived at camp near Williamsburg on September 10, just four days ahead of Washington and Rochambeau. Unfortunately none of his reports have been found, nor is it clear how successful he was in persuading local citizens hastily to repair their roads.

Considering the many factors involved, the coordinated concentration of American and French troops and supplies in Virginia was achieved with remarkable ease. Both armies were determined to redeem their alliance. Even though Cornwallis's men were outnumbered, suffering from illness, protected by less than formidable defenses, and had little chance of escaping, the allies decided to undertake a full-scale siege of Yorktown.

Although several of Duportail's engineer officers were still imprisoned following their capture at Charleston in 1780, the allies had more than a dozen engineers at Yorktown. The progress of the siege reflected the presence and the influence of Marshal Sébastien le Prestre de Vauban, master of eighteenth-century siegecraft. In just three weeks the siege progressed methodically through several stages: initial investment on September 28; reconnaissance; digging of the first parallel and lines of circumvallation and countervallation; construction of batteries and a zigzag; heavy artillery fire; a second parallel completed with the dramatic storming of two enemy redoubts; continued heavy artillery fire; and, on October 19, final capitulation by the enemy.

Records of the action at Yorktown abound. From these, several have been selected because they best reflect the role of the Continental Army's Corps of Engineers and its companies of sappers and miners. This siege represented the most concerted effort by these units during the entire Revolutionary War.

THE ROAD FROM ALEXANDRIA. *This map of a Virginia road is one of twenty maps marking the route from Philadelphia to Yorktown, prepared by the geographer's department under the direction of Simeon DeWitt (1756–1834), Robert Erskine's successor as geographer. These maps helped guide the armies of Washington and Rochambeau on their march south in 1781. The route surveyed here crosses the Great Hunting Creek southwest of Alexandria, skirts Washington's Mt. Vernon, and passes Pohick Church to a point (near Colchester) below the Pohick River.*

Courtesy New-York Historical Society, New York City

Although he penned his account years after the Revolution, Sergeant Martin of the sappers and miners left a powerful record of the entire siege. Selections from his reminiscences follow throughout the remainder of this chapter. In the first he described with ready wit the initial preparations for the siege.

5. "HERE AGAIN WE ENCOUNTERED OUR OLD ASSOCIATE, HUNGER"

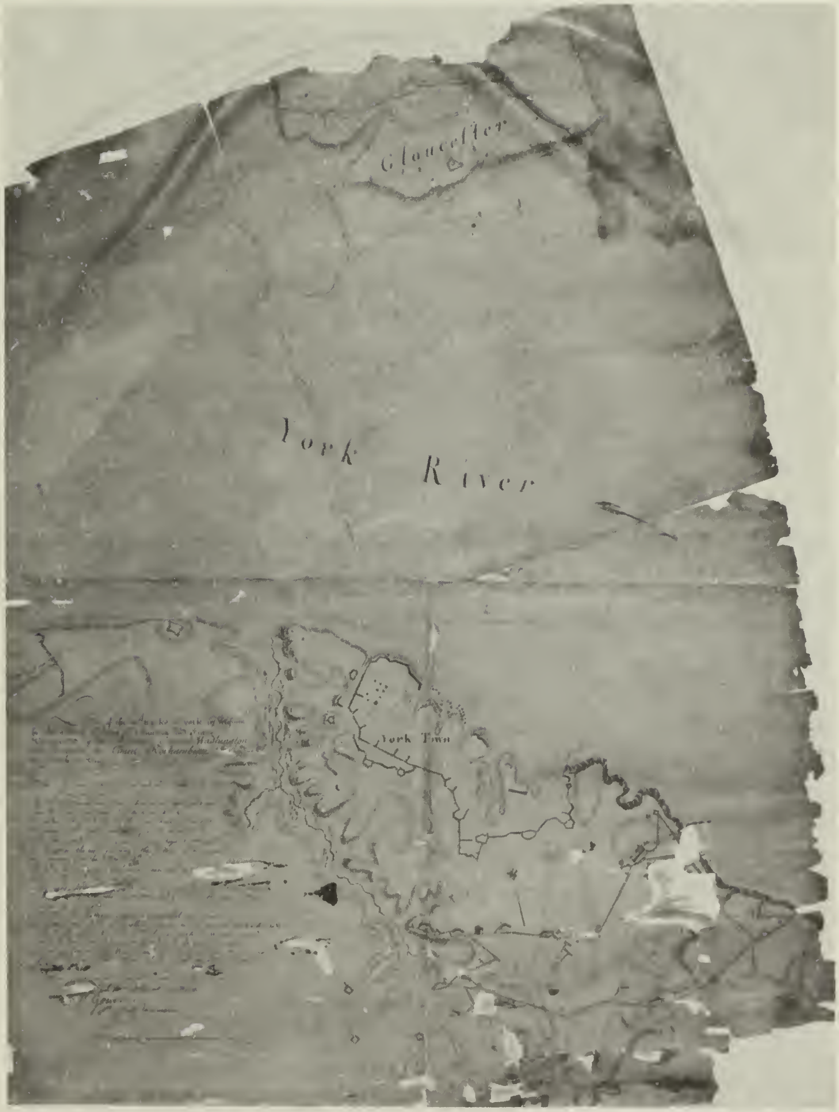
From the narrative of Joseph Plumb Martin.

Soon after landing we marched to Williamsburg, where we joined General Lafayette, and very soon after, our whole army arriving, we prepared to move down and pay our old acquaintance, the British, at Yorktown, a visit. I doubt not but their wish was not to have so many of us come at once as their accommodations were rather scanty. They thought, "The fewer the better cheer." We thought, "The more the merrier." We had come a long way to see them and were unwilling to be put off with excuses. We thought the present time quite as convenient, at least for us, as any future time could be, and we accordingly persisted, hoping that, as they pretended to be a very courtly people, they would have the politeness to come out and meet us, which would greatly shorten the time to be spent in the visit, and save themselves and us much labor and trouble, but they were too impolite at this time to do so.

We marched from Williamsburg the last of September [1781]. It was a warm day [the twenty-eighth]. When we had proceeded about halfway to Yorktown we halted and rested two or three hours. Being about to cook some victuals, I saw a fire which some of the Pennsylvania troops had kindled a short distance off. I went to get some fire while some of my messmates made other preparations, we having turned our rum and pepper cook adrift. I had taken off my coat and unbuttoned my waistcoat, it being (as I said before) very warm. My pocketbook, containing about five dollars in money and some other articles, in all about seven dollars, was in my waistcoat pocket. When I came among the stangers they appeared to be uncommonly complaisant, asking many questions, helping me to fire, and chatting very familiarly. I took my fire and returned, but it was not long before I perceived that those kindhearted helpers had helped themselves to my pocketbook and its whole contents. I felt mortally chagrined, but

THE WORKS AT YORKTOWN. *Colonel Gouvion of the Corps of Engineers drew this plan of the British defenses and the American and French siege works.*

Record Group 360, National Archives


Glouceſter
York River
York Town
Washington

there was no plaster for my sore but patience, and my plaster of that, at this time, I am sure, was very small and very thinly spread, for it never covered the wound.

Here, or about this time, we had orders from the Commander in Chief that, in case the enemy should come out to meet us, we should exchange but one round with them and then decide the conflict with the bayonet, as they valued themselves at that instrument. The French forces could play their part at it, and the Americans were never backward at trying its virtue. The British, however, did not think fit at that time to give us an opporunity to soil our bayonets in their carcasses, but why they did not we could never conjecture; we as much expected it as we expected to find them there.

We went on and soon arrived and encamped in their neighborhood, without let or molestation. Our Miners lay about a mile and a half from their works, in open view of them. Here again we encountered our old associate, Hunger. Affairs, as they respected provisions, etc., were not yet regulated. No eatable stores had arrived, nor could we expect they should until we knew what reception the enemy would give us. We were, therefore, compelled to try our hands at foraging again. We, that is, our corps of Miners, were encamped near a large wood. There was a plenty of shoats all about this wood, fat and plump, weighing, generally, from fifty to a hundred pounds apiece. We soon found some of them and as no owner appeared to be at hand and the hogs not understanding our inquiries (if we made any) sufficiently to inform us to whom they belonged, we made free with some of them to satisfy the calls of nature till we could be better supplied, if better we could be. Our officers countenanced us and that was all the permission we wanted, and many of us did not want even that.

We now began to make preparations for laying close siege to the enemy. We had holed him and nothing remained but to dig him out. Accordingly, after taking every precaution to prevent his escape, [we] settled our guards, provided fascines and gabions, made platforms for the batteries, to be laid down when needed, brought on our battering pieces, ammunition, etc.

—Martin, *Private Yankee Doodle*, pp. 228–30.

The following account by Michel Capitaine du Chesnoy[12] carried the story from the placement of troops—Claude Henry, the comte de St. Simon, on the left, Rochambeau in the center, and the Americans on the right—and focused on engineer activity in the crucial stage of reconnaissance. As Capitaine made clear, reconnoitering was a challenge at Yorktown. An important development in the early stage of the siege was the enemy's decision to abandon their advance positions, redoubts at Pigeon Quarter along the Goosley Road. The Americans and the French quickly took them over and converted them to their own use.

6. "THE ENTIRE PLACE WAS SCATTERED WITH EARTH WORKS, WAS BRISTLING WITH POINTED STAKES"

From the Yorktown journal of Capitaine du Chesnoy.

On the 29th [September 1781], the American engineers, those of the army of Rochambeau and those of the division of the Marquis de St. Simon, numbering 13 all told, formed in three divisions, each of four, de Querenet [Guillaume, Querenet de La Combe] commanding the body of French engineers (Desandroun [Jean-Nicholas Desandrouins] being dangerously ill at Williamsburg); Duportail, American Brigadier, commanded the engineers attached to the same service. . . .

On the 29th, reconnoissance of the place was made; a broad, deep ravine traversed by a swampy brook surrounded half of the place on the right; for a distance of more than 800 toises (4800 feet), in front the enemy had placed abbatis on the summit (three quarters of this extent was cut by deep ravines); they had established a large redoubt on the right at the very crest of the hill, this redoubt was covered with pointed stakes and by a heavy abbatis which was well made; in front (nearer us) the enemy had made the ground difficult (to cross) by trees cut down and left facing us; near the brooks we have just mentioned, which emptied into the York River, [were] two other redoubts, bristling with stakes and palisaded, and surrounded by an abbatis, spread out towards their center; between them was the York-Williamsburg road; they occupied the crest of the higher ground of the other side of the ravine about 350 toises (2100 feet) from the center of the town; in front of these, the terrain sloped towards the countryside; their left was covered by three batteries distant from 300 . . . toises (1800 feet) to 400 toises (2400 feet) from the center of the town, with an abbatis in front of them. This was supported, on one corner, by a body of chasseurs, with a battery near a destroyed mill, which was at the other end of their left; for a ditch they had a creek; these batteries likewise all occupied high ground, and in front of which the plain sloped down and hid from view all the trenches with which they had covered the town of York.

It can be seen from this description, how difficult it was to make a reconnoissance of the place; all that could be investigated were the more forward fortifications, and even as to these, in several aspects, the details were difficult to ascertain, and then it was only imperfectly. They had encamped part of their troops between the redoubts and the batteries, and the main town, in a way that indicated they could extend them and defend them with the advantages of the lay of the land and of the high ground. We would be obliged to attack them with great force, and we should not have been able to do this without great loss, if the enemy had not abandoned these redoubts and batteries.

This happened on the 29th to the 30th. In the morning of the 30th our troops perceiving this, took immediate possession; 100 men entered the redoubt of Pigeon Quarter and 50 that of Penny Hill, one of the two batteries near by was changed into a redoubt, and we constructed a middle one at the head of the big ravine; this work progressed under the annoying fire of the enemy.

Thereafter reconnoissances were more easily made; these we carried on until [October] 5th; meanwhile the heavy artillery was unloaded, and the troops prepared themselves for the work of the siege, and munitions were carried to the artillery park, and in this interval from the 30th of September to October 5th, Baron Viomenil attacked the advance abbatis of the redoubt on the left, and forced the enemy to withdraw into their works.

The entire place was scattered with earth works, was bristling with pointed stakes, and enveloped or covered with abbatis, which Lord Cornwallis had had constructed after the arroval of the army of the Count de Grasse. It seems that he had not at first expected any attack except from the troops commanded by Major General de la Fayette, and the Marquis de St. Simon; learning, however, of the arrival of the armies of General

SIEGE OF YORKTOWN. *The drawing depicts Washington and Rochambeau consulting with staff members at Yorktown.*
Record Group 148, National Archives

Washington and Rochambeau, he . . . constructed detached works . . . while awaiting the investment. He also had worked meanwhile upon another trench on his exposed left (his right was protected by a ravine which could not be crossed). During the reconnoissance from September 30th to October 5th, we perceived new works completed at night, and these he continued to construct up to the very moment our batteries opened fire. . . .

We still continued constructing the trenches, the redoubts and the communications toward the rear; half of the engineers had mounted the trenches from the 6th to the 7th, and from the 7th to the 8th, but from the 8th to the 9th they mounted in divisions, and thus continued during the remainder of the siege. On the 9th, in the afternoon, some batteries being found ready to fire, both French and American, a few shots were fired.

—S.W. Jackson Collection, Yale University Library.

On October 6, as work began on the first parallel, Washington issued general orders for the conduct of the siege. The orders indicated the manner in which the trenches would be manned and relieved, delineated duties and responsibilities, and specified the desired measurements to be used in making gabions, fascines, and hurdles. Sections 43 and 44 defined the responsibilities and authority of the engineer officers.

7. REGULATIONS FOR THE SERVICE OF THE SIEGE AT YORKTOWN

From George Washington's general orders.

October 6, 1781

1. The service of the siege will be performed by Divisions alternately; the Fatigue men will first be detailed out of the Division and the remainder will form Battalions under their respective Commanders to guard the Trenches; the first night there will be an exception to this Rule; the first regiment of each Brigade will that Night form a Divison, Commanded by Major General Lincoln.

2d. The divisions shall be warned for the Trenches, the preceding evening, and they are to furnish no guards when they mount the Trenches.

3d. No Officer or soldier of a Regiment Commanded for the Trenches will be excused from Mounting unless he be sick; the quarter guard of each regiment will alone remain in Camp.

4th. The Major General of the Division which Mounts, will be Major General of the Trenches, the Brigadiers will Mount with their Brigades.

5th. The General Officers of the Trenches will reconnoitre carefully all the Avenues, places of Arms and advantageous Angles, that he may determine in Consequence the order and position of the Troops, in case of attack.

6. The Inspector of the Division which Mounts, will do the duty of Major of the Trenches. He will make the detail of the service of the troops during the twenty four hours that he shall be there, and attend to the punctual observance of Orders.

7. He will visit before hand all the Posts of the Trenches, and visit them again when the troops are posted there in order to make a state of them, and communicate promptly to each the orders of the General Officer: near whom he is to keep himself to receive them. Each Brigade to send to the General of the trenches an orderly Officer.

8. The Major of the Trenches will be instructed by the General Officers, of the Alarm posts in case of a Sally, and take care to inform the Troops of it.

9th. An officer of rank will be appointed by the Commander in chief to act as superintendant of the deposit of the Trenches, for the following important service during the whole siege vizt. To take charge of all the sand bags Fascines, Gabions, Hurdles and other Materials deposited at the place which the Engeneers will appoint and keep an accurate state of them.

10th. He is to deliver the sand bags and necessary tools for the work, and take care that the tools are redelivered when they are no longer wanted. . . .

16. He will above all watch over every thing which relates to order and regularity in the Trenches, except in the disposition of the Troops, which is the particular province of the Major of the trenches.

17. The Trenches shall be releived [*sic*] every Twenty four hours unless a particular order to the contrary by the General in which case the the relief shall be in the rear of the others.

18. The General having fixed the hour for Mounting the trenches, . . . the parade for assembling the Reliefs [shall] be on the ground sufficiently before hand to give the General Officers and Adjutant General time for inspection. . . .

25. All the troops either relieving or relieved will March with Drums beating Colours flying and carry Arms to the place from whence they are to file off when they will support their Arms.

26. When the Troops shall have taken their post in the trenches, the standard bearrers will plant their standards upon the Epaulments and sentries will be posted with proper intervals, with orders to give Notice of whatever they may see coming out from the place and of the shells that may be thrown by the Enemy, but no notice to be given or any movement to be made for Cannon shot.

27. The sand-bags will be desposed on the Epaulments of the Trenches, to cover the sentries.

28. The officers will cause each soldier to work in his place to enlarge the trench and strengthen the Epaulments.

29th. No honor to be rendered in the trenches when the Commander in Chief and Generl. Officers of the Trenches visit them; the soldiers will stand to their Arms facing the Epaulment and ready to mount the banquet.

30. When the Troops retire from the Trenches, they will March in reversed Columns. . . .

33. The Infantry are to make the number of Gabions, etc., ordered them.

34. The Gabions are to be three feet high including the end of the Pecquetts [pickets] which are to enter the ground, they are to have two feet and a half diameter and be formed of Nine Picquetts, each of two and a half inches circumference interlaced with branchery, striped of leaves to be equally closed at top and bottom, in order that they may not be larger at one end than the other.

35. Hurdles shall be six feet long and three feet wide and shall be made of Nine Picketts, each of two inches and a half to three inches circumference, equally distant from each other and interwoven with stronger Branchery than that employed for the Gabions.

36. The Fascines are to be six feet long and six inches through, to be made of branchery, the twigs of which are to be crossed, to be bound with Withs and each end and in the middle, to each fascine, three picketts of three feet long and two or three inches diameter.

37. The Brigades shall always have at the head of their Camp, the stated Number of fascines which they will replace in proportion as they are used.

38. The Commandants of Corps shall be responsible for the observance of the dementions of the Materials employed in the trenches inattention in this point being very pernicious to the service.

39. Each soldier going to the Trenches either to mount Guard or Work shall take with him a fascine to be left at the Deposit of the Trenches. . . .

43. The fatigue men are to March near each other and Observe the greatest silence when the Engineers place them.

44. The Officers who Command the fatigue parties will be constantly with their detachments and exactly observe the directions of the Engineers.

45. When the work is Commenced they are to walk constantly along their detachments to make the soldiers perform their duty obliging them to cover themselves with alacrity and afterwards to perfect the work.

46. The Officers of covering parties will cause their soldiers to sit down, hinder them from quitting their Musquetts which they are to hold before them, the butt on the ground.

47. The advanced posts of such Detachments as are Commanded by Non Commissioned Officers will remain prostate untill the trench is sufficiently deep to cover a man to the waist; when the Detachment with their advanced Posts will retire into the trenches, to Occupy the Head of the Work which shall have been made.

48. In the saps, Batteries and other places adjacent to the deposits of powder no soldier is to be permitted to smoke.

49. In case of a sally, the Fatigue men are to retire briskly into some part of the Trenches where they may not embarrass the Troops, they are to retire in preference to the place where their Arms were lodged.

50. The Troops will march briskly out of the Trenches and repair to the place of Arms, batteries, Angles and Avenues which shall have been designated to them from whence they may defend it more advantageously and take the enemy in reverse or flank, taking particular care not to occupy the banquet for the defence of the Epaulment: but always to post themselves in the reverse of the Trenches.

51. During the sally all the Batteries will direct their fire upon the front of attack in order to desperse the besieged.

52. When the troops shall have repulsed the Enemy, they are not to pursue them but wait the orders of their General Officers to resume their posts in the Trenches.

53. As soon as the attack is finished, the Officers of fatigue will reconduct their detachments to Work and call the rolle, that any absent soldiers may be punished at return to Camp.

54. At the hour for withdrawing the fatigue, the Detachments are to return in good order and the Officers are to report to the Commandant of the Regiment what has been the conduct of the soldiers.

55. Besides the fatigue men of the trenches a sufficient detachment shall be given to the superintendant of the Deposit in the Trenches whose service shall be for twenty four hours: this officer is to employ them in collecting the tools, in making the different distributions, in going with the Litters, and bringing the wounded to the hospital of first dressings.

—Fitzpatrick, *Writings of Washington,* 23:179–85.

The journal of Capt. James Duncan, a company commander in Colonel Moses Hazen's regiment, described siege preparations from the point of view of an officer performing fatigue duty under the engineers' direction. Such accounts are rare. The following excerpt carries the story through the opening of the first parallel and on to the opening of the American batteries on October 9. Enemy artillery fire was intense as the trenches were dug, but soon the trenches were so deep that scarcely any harm resulted. Duncan reiterated "that the enemy by evacuating their [advance] works had given us an amazing advantage."

8. "THE ENEMY KEPT UP AN ALMOST INCESSANT FIRE"

From James Duncan's Yorktown diary.

October 1 [1781]—About 8 o'clock this morning the French grenadiers attacked and carried a small battery, with the loss of four killed and six wounded. Ten companies were ordered out early this morning for fatigue, of which I had the honor to command one. Until 11 a.m. we were employed in cutting and stripping branches for gabions. On being furnished with shovels, spades, pickaxes, etc., we were ordered up to the lines, where we continued inactive until about an hour before sunset. In the meantime, the engineers were employed in reconnoitering the enemy's works, and fixing on proper places to break the first ground. Let me here observe that the enemy by evacuating their works had given us an amazing advantage, as the ground they left commanded the whole town, and nothing but the reasons before alleged could have justified them in so doing, as by contrary conduct they must have very much retarded the operations of the siege.

The engineers having fixed on and chained off the ground in two different places to erect their works within point blank shot of the enemy, the parties were called on. Five companies were ordered to an eminence on the right and five to another on the left. It happened to be my fate to be stationed on the left, a place the most dangerous of the two, as it was nearest to the enemy, and more exposed to the fire from the enemy's batteries.

We were now conducted to a small hollow near the ground. Five men were ordered by the engineer to assist him in clearing away the rubbish, staking out and drawing the lines of the work. This was in the face of open day, and the men went with some reluctance; a little before this we had a shot from the enemy which increased their fears. At dusk of evening we all marched up, and never did I see men exert themselves half so much or work with more eagerness. Indeed, it was their interest, for they could expect nothing else but an incessant roar of cannon the whole night. I must confess I too had my fears, but fortunately for us they did not fire a shot that whole night. I am at a loss to account for it, for the moon shone bright, and by the help of their night glasses they must certainly have discovered us. We were relieved about daybreak, and scarcely had we left the trenches when the enemy began their fire on both works from three pieces.

October 2—The works were so far finished in the course of the preceding night that the men worked in them this day with very little danger, although the enemy kept up an almost incessant fire from two pieces of artillery. A drummer, rather too curious in his observations, was this day killed with a cannon ball. . . .

October 5—We had more firing from the enemy last night than any night since the commencement of the siege, but don't learn that they did any other harm than delay the operation of the works. This day the regiment was employed in cutting and making fasscines, and a regiment from every brigade in the army ordered out for some extra fatigue duty this evening. . . .

October 7—The regiments ordered for the extra duty were last night employed in drawing the line of circumvallation. This line extends itself to the river on each side the town, and at all places nearly equally distant and better than 200 yards in front of the former works. The enemy discovered us, although the night was pretty favorable, but the chief of their fire was directed against the French. They were, no doubt, much astonished in the morning to find themselves so completely hemmed in on all sides, and trenches so deep that we could sustain little or no harm from their fire. . . . Our orders were this night that if the enemy made a sortie and attempted to storm the trenches we were to give them one fire from the ba[n]quet, rush over the parapet and meet them with the bayonet. . . .

October 8—The fire of the enemy was this day chiefly directed against the parties employed in erecting batteries. We were relieved about 12 o'clock and sustained no harm during our tour excepting two men badly wounded; but we had scarcely left the trenches when a man working on the parapet had his arm shot off. . . .

October 9—Last night the troops in the trenches as well as great part of this day, were busily employed in finishing the batteries, and about 4 o'clock this afternoon an American battery was opened . . . .

—*Pennsylvania Archives,* 2d. ser., 15:749–50.

Joseph Plumb Martin preferred duty in the trenches every third day to the intervening two days in camp, where "we had nothing else to do but attend morning and evening roll calls and recreate ourselves as we pleased." Martin's penchant for action was reflected in his vivid portrayal of events during the same period covered by Duncan above. Here is an account filled with drama: General Washington, unrecognized, visiting the trenches and then ceremoniously breaking ground; the troops entrenching under the nose of the sidetracked enemy; and rebel batteries opening fire on the enemy as the French troops shout, "Huzza for the Americans!"

Martin also clarified the role of the sappers and miners in laying out the lines and described the rebels' success in surprising the enemy.

9. "THE BRITISH WERE LED TO IMAGINE THAT WE WERE ABOUT SOME SECRET MISCHIEF"

From the narrative of Joseph Plumb Martin.

On the fifth of October [1781] we began to put our plans into execution.

One-third part of all the troops were put in requisition to be employed in opening the trenches. A third part of our Sappers and Miners were ordered out this night to assist the engineers in laying out the works. It was a very dark and rainy night. However, we repaired to the place and began by following the engineers and laying laths of pine wood end-to-end upon the line marked out by the officers for the trenches. We had not proceeded far in the business before the engineers ordered us to desist and remain where we were and be sure not to straggle a foot from the spot while they were absent from us. In a few minutes after their departure, there came a man alone to us, having on a surtout,[13] as we conjectured, it being exceeding dark, and inquired for the engineers. We now began to be a little jealous for our safety, being alone and without arms, and within forty rods of the British trenches. The stranger inquired what troops we were, talked familiarly with us a few minutes, when, being informed which way the officers had gone, he went off in the same direction, after strictly charging us, in case we should be taken prisoners, not to discover to the enemy what troops we were. We were obliged to him for his kind advice, but we considered ourselves as standing in no great need of it, for we knew as well as he did that Sappers and Miners were allowed no quarters, at least, are entitled to none; by the laws of warfare, and of course should take care, if taken, and the enemy did not find us out, not to betray our own secret.[14]

In a short time the engineers returned and the afore-mentioned stranger with them. They discoursed together some time when, by the officers often calling him "Your Excellency," we discovered that it was General Washington. Had we dared, we might have cautioned him for exposing himself too carelessly to danger at such a time, and doubtless he would have taken it in good part if we had. But nothing ill happened to either him or ourselves.

It coming on to rain hard, we were ordered back to our tents, and nothing more was done that night. The next night, which was the sixth of October, the same men were ordered to the lines that had been there the night before. We this night completed laying out the works. The troops of the line were there ready with entrenching tools and began to entrench, after General Washington had struck a few blows with a pickax, a mere ceremony, that it might be said "General Washington with his own hands first broke ground at the siege of Yorktown." The ground was sandy and soft, and the men employed that night eat no "idle bread" (and I question if they eat any other), so that by daylight they had covered themselves from danger from the enemy's shot, who, it appeared, never mistrusted that we were so near them the whole night, their attention being directed to another quarter. There was upon the right of their works a marsh. Our people had sent to the western side of this marsh a detachment to make a number of fires, by which, and our men often passing before the fires, the British were led to imagine that we were about some secret mischief there, and consequently directed their whole fire to that quarter, while we were entrenching literally under their noses.

As soon as it was day they perceived their mistake and began to fire where they ought to have done sooner. They brought out a field piece or two without their trenches, and discharged several shots at the men who were at work erecting a bomb battery, but their shot had no effect and they soon gave it over. They had a large bulldog and every time they fired he would follow their shots across our trenches. Our officers wished to catch him and oblige him to carry a message from them into the town to his masters, but he looked too formidable for any of us to encounter.

I do not remember, exactly, the number of days we were employed before we got our batteries in readiness to open upon the enemy, but think it was not more than two or three. The French, who were upon our left, had completed their batteries a few hours before us, but were not allowed to discharge their pieces till the American batteries were ready. Our commanding battery was on the near bank of the [York] river and contained ten heavy guns; the next was a bomb battery of three large mortars; and so on through the whole line. The whole number, American and French, was ninety-two cannon, mortars and howitzers. Our flagstaff was in the ten-gun battery, upon the right of the whole. I was in the trenches the day that the batteries were to be opened. All were upon the tiptoe of expectation and impatience to see the signal given to open the whole line of batteries, which was to be the hoisting of the American flag in the ten-gun battery. About noon the much-wished-for signal went up. I confess I felt a secret pride swell my heart when I saw the "star-spangled banner" waving majestically in the very faces of our implacable adversaries. It appeared like an omen of success to our enterprise, and so it proved in reality. A simultaneous discharge of all the guns in the line followed, the French troops accompanying it with "Huzza for the Americans!" It was said that the first shell sent from our batteries entered an elegant house formerly owned or occupied by the Secretary of State under the British government, and burned directly over a table surrounded by a large party of British officers at dinner, killing and wounding a number of them. This was a warm day to the British.

—Martin, *Private Yankee Doodle*, pp. 230–34.

Continental Army surgeon James Thacher, in his journal, emphasized again the rigors of opening the trenches and the horror of working under artillery fire. The following excerpt contains a particularly evocative description of the view from the trenches of the bombshells, which "in the night . . . appear like a fiery meteor with a blazing tail . . . gradually descending to the spot where they are destined to execute their work of destruction." When the American batteries were ready on October 9, "Washington put the match to the first gun, and a furious discharge of cannon and mortars immediately followed."

10. "I HAVE A FINE OPPORTUNITY OF WITNESSING THE SUBLIME AND STUPENDOUS SCENE"

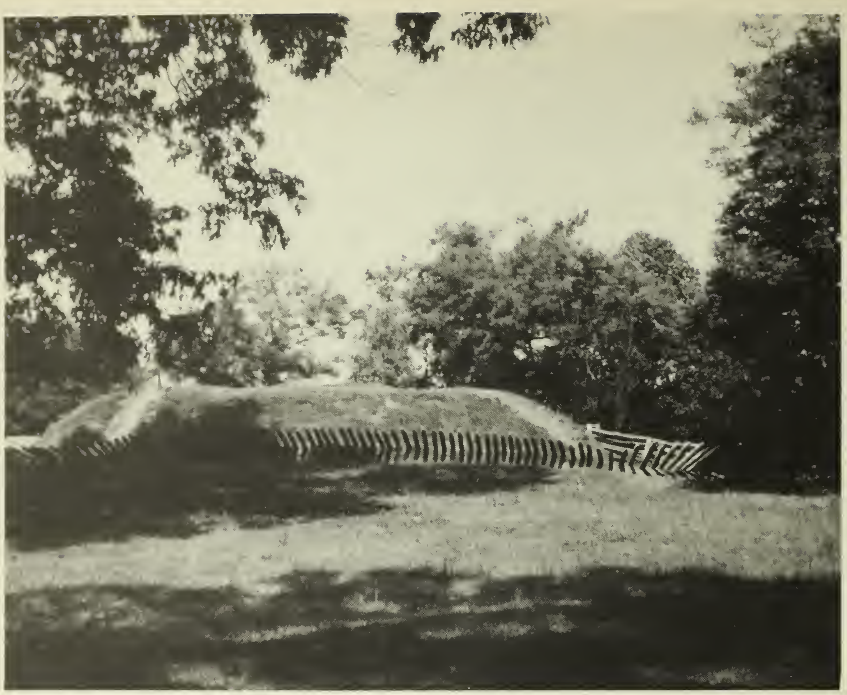
From James Thacher's journal.

7th [*October 1781*]—A large detachment of the allied army, under command of Major General Lincoln, were ordered out last evening, for the purpose of opening intrenchments near the enemy's lines. This business was conducted with great silence and secrecy, and we were favored by Providence with a night of extreme darkness, and were not discovered before day light. The working party carried on their shoulders fascines and intrenching tools, while a large part of the detachment was armed with the implements of death. Horses, drawing cannon and ordnance, and wagons loaded with bags filled with sand for constructing breast works, followed in the rear. Thus arranged, every officer and soldier knowing his particular station, orders were given to advance in perfect silence, the distance about one mile. . . .

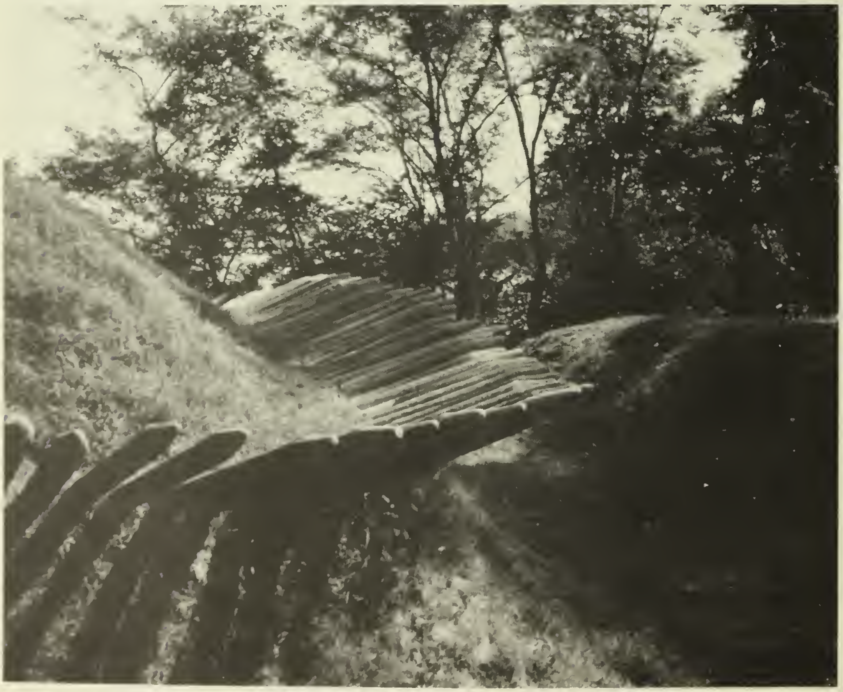
Our troops were indefatigable in their labors during the night, and before day light they had nearly completed the first parallel line of nearly two miles in extent, besides laying a foundation for two redoubts, within about six hundred yards of the enemy's lines. At day light the enemy having discovered our works, commenced a severe cannonade, but our men being under cover received no injury. . . .

8th, and 9th—The duty of our troops has been for several days extremely severe; our regiment labors in the trenches every other day and night, where I find it difficult to avoid suffering by the cold, having no other covering than a single blanket in the open field. We erected a battery last night in front of our first parallel, without any annoyance from the enemy. Two or three of our batteries being now prepared to open on the town, his Excellency General Washington put the match to the first gun, and a furious discharge of cannon and mortars immediately followed, and Earl Cornwallis has received his first salutation. . . .

10th–15th—We have now made further approaches to the town, by throwing up a second parallel line, and batteries within about three hundred yards, this was effected in the night, and at day light the enemy were roused to the greatest exertions, the engines of war have raged with redoubled fury and destruction on both sides, no cessation day or night. The French had two officers wounded, and fifteen men killed or wounded, and among the Americans, two or three were wounded. I assisted in amputating a man's thigh. The siege is daily becoming more and more formidable and alarming, and his Lordship must view his situation as extremely critical, if not desperate. Being in the trenches every other night and day, I have a fine opportunity of witnessing the sublime and stupen-



REDOUBT NO. 10. *The photographs provide two views of the restoration at Yorktown showing fraisework of the redoubt captured by Americans during the siege.*



dous scene which is continually exhibiting. The bomb shells from the besiegers and the besieged are incessantly crossing each others' path in the air. They are clearly visible in the form of a black ball in the day, but in the night, they appear like a fiery meteor with a blazing tail, most beautifully brilliant, ascending majestically from the mortar to a certain altitude, and gradually descending to the spot where they are destined to execute their work of destruction. It is astonishing with what accuracy an experienced gunner will make his calculations, that a shell shall fall within a few feet of a given point, and burst at the precise time, though at a great distance. When a shell falls, it whirls round, burrows, and excavates the earth to a considerable extent, and bursting, makes dreadful havoc around.

—Thacher, *Military Journal*, pp. 337–40.

A major aspect of the allied siege was the storming of Redoubts Nine and Ten, two works standing about 300 yards in front of the main enemy line. Control of these positions was essential to completion of the second parallel.

Beginning on October 11 the French constructed an epaulement as near as possible to the two enemy redoubts. Then artillery was moved into place. On the 14th subordinates told Washington all was in readiness for a direct attack. The Americans, led by Lt. Col. Alexander Hamilton, would take Redoubt Ten, the French would take Redoubt Nine. At eight in the evening, an unusual hour for an attack that was chosen deliberately to achieve surprise, prearranged gunfire gave the signal. The allies moved forward simultaneously. Each force met with resistance but each succeeded.

Hamilton's unit included a contingent of sappers and miners charged with clearing the way for the infantry through the protective abatis. Martin was one of the besiegers. His depiction of the action is his best chronicle and among the finest of the Yorktown accounts.

11. "I THOUGHT THE BRITISH WERE KILLING US OFF AT A GREAT RATE"

From the narrative of Joseph Plumb Martin.

The siege was carried on warmly for several days, when most of the guns in the enemy's works were silenced. We now began our second parallel, about halfway between our works and theirs. There were two strong redoubts held by the British, on their left [Redoubts Nine and Ten].

It was necessary for us to possess those redoubts before we could complete our trenches. One afternoon [14 October 1781], I, with the rest of our corps that had been on duty in the trenches the night but one before, were ordered to the lines. I mistrusted something extraordinary, serious or comical, was going forward, but what I could not easily conjecture.

We arrived at the trenches a little before sunset. I saw several officers fixing bayonets on long staves. I then concluded we were about to make a general assault upon the enemy's works, but before dark I was informed of the whole plan, which was to storm the redoubts, the one by the Americans, and the other by the French. The Sappers and Miners were furnished with axes and were to proceed in front and cut a passage for the troops through the abatis, which are composed of the tops of trees, the small branches cut off with a slanting stroke which renders them as sharp as spikes. These trees are then laid at a small distance from the trench or ditch, pointing outwards, and the butts fastened to the ground in such a manner that they cannot be removed by those on the outside of them. It is almost impossible to get through them. Through these we were to cut a passage before we or the other assailants could enter.

At dark the detachment was formed and advanced beyond the trenches and lay down on the ground to await the signal for advancing to the attack, which was to be three shells from a certain battery near where we were lying. All the batteries in our line were silent, and we lay anxiously waiting for the signal. The two brilliant planets, Jupiter and Venus, were in close contact in the western hemisphere, the same direction that the signal was to be made in. When I happened to cast my eyes to that quarter, which was often, and I caught a glance of them, I was ready to spring on my feet, thinking they were the signal for starting. Our watchword was "Rochambeau," the commander of the French forces' name, a good watchword, for being pronounced *Ro-sham-bow*, it sounded when pronounced quick, like *rush-on-boys*.

We had not lain here long before the expected signal was given, for us and the French, who were to storm the other redoubt, by the three shells with their fiery trains mounting the air in quick succession. The word *up*, *up*, was then reiterated through the detachment. We immediately moved silently on toward the redoubt we were to attack, with unloaded muskets. Just as we arrived at the abatis, the enemy discovered us and directly opened a sharp fire upon us. We were now at a place where many of our large shells had burst in the ground, making holes sufficient to bury an ox in. The men, having their eyes fixed upon what was transacting before them, were every now and then falling into these holes. I thought the British were killing us off at a great rate. At length, one of the holes happening to pick me up, I found out the mystery of the huge slaughter.

As soon as the firing began, our people began to cry, "The fort's our own!" and it was "Rush on boys." The Sappers and Miners soon cleared a passage for the infantry, who entered it rapidly. Our Miners were ordered not to enter the fort, but there was no stopping them. "We will go," said they. "Then go to the d---l," said the commanding officer of our corps,[15] "if you will." I therefore forced a passage at a place where I saw our shot had cut away some of the abatis; several others entered at the same place. While passing, a man at my side received a ball in his head and fell under my feet, crying out bitterly. While crossing the trench, the enemy threw hand grenades (small shells) into it. They were so thick that I at first thought them cartridge papers on fire, but was soon undeceived by their cracking. As I mounted the breastwork, I met an old associate hitching himself down into the trench. I knew him by the light of the enemy's musketry, it was so vivid. The fort was taken and all quiet in a very short time. Immediately after the firing ceased, I went out to see what had become of my wounded friend and the other that fell in the passage. They were both dead. In the heat of the action I saw a British soldier jump over the walls of the fort next the river and go down the bank, which was almost perpendicular and twenty or thirty feet high. When he came to the beach he made off for the town, and if he did not make good use of his legs I never saw a man that did.

ACTION AT YORKTOWN. *A French artist made this lithograph to portray the taking of Yorktown by the allied forces.*
Library of Congress

All that were in the action of storming the redoubt were exempted from further duty that night. We laid down upon the ground and rested the remainder of the night as well as a constant discharge of grape and canister shot would permit us to do, while those who were on duty for the day completed the second parallel by including the captured redoubts within it. We returned to camp early in the morning, all safe and sound, except one of our lieutenants,[16] who had received a slight wound on the top of the shoulder by a musket shot. Seven or eight men belonging to the infantry were killed, and a number wounded.

—**Martin, *Private Yankee Doodle*, pp. 234–37.**

Thacher provided another view of the assault, stressing the reasons why the Americans suffered fewer casualties than their French counterparts. Clearly one reason for the difference was that the Americans barely waited for their sappers and miners to clear the way, while the French—"perhaps because they were formalists"—let their own pioneers completely finish the job.[17]

12. "THE ASSAILANTS BRAVELY ENTERED THE FORT . . . WITHOUT FIRING A SINGLE GUN"

From James Thacher's journal.

The enemy having two redoubts, about three hundred yards in front of their principal works, which enfiladed our entrenchment and impeded our approaches, it was resolved to take possession of them both by assault. The one on the left of the British garrison, bordering on the banks of the river, was assigned to our brigade of light infantry, under the command of the Marquis de la Fayette. The advanced corps was led on by the intrepid Colonel Hamilton, who had commanded a regiment of light infantry during the campaign, and assisted by Colonel Gimat. The assault commenced at eight o'clock in the evening [14 October 1781], and the assailants bravely entered the fort with the point of the bayonet without firing a single gun. We suffered the loss of eight men killed, and about thirty wounded . . . . The other redoubt on the right of the British lines was assaulted at the same time by a detachment of the French, commanded by the gallant Baron de Viominel. Such was the ardor displayed by the assailants, that all resistance was soon overcome, though at the expense of nearly one hundred men killed and wounded. [*In a note Thacher provided the following explanation:*]

The cause of the great loss sustained by the French troops in comparison with that of the Americans, in storming their respective redoubts, was that the American troops when they came to the abattis, removed a part of it with their hands and leaped over the remainder. The French troops on coming up to theirs, waited till their pioneers had cut away the abattis secundum artem, which exposed them longer to the galling fire of the enemy. To this cause also is to be ascribed the circumstance, that the redoubt assailed by the Americans, was carried before that attacked by the French troops. The Marquis de la Fayette, sent his aid, Major Barbour [William Barber] through the tremendous fire of the whole line of the British, to inform the Baron Viominel, that "he was in his redoubt, and to ask the Baron where he was." The major found the Baron waiting the clearing away the abattis, but sent this answer, "tell the Marquis I am not in mine, but will be in five minutes." He instantly advanced, and was within or nearly so, within his time.

Of the defenders of the redoubt, eighteen were killed, and one captain and two subaltern officers and forty two rank and file captured. Our second parallel line was immediately connected with the two redoubts now taken from the enemy, and some new batteries were thrown up in front of our second parallel line, with a covert way, and angling work approaching to less than three hundred yards of their principal forts. These will soon be mantled with cannon and mortars, and when their horrid thundering commences, it must convince his Lordship, that his post is not invincible, and that submission must soon be his only alternative. Our artillery men, by the exactness of their aim, make every discharge take effect, so that many of the enemy's guns are entirely silenced and their works are almost in ruins.

16th—A party of the enemy, consisting of about four hundred men, commanded by Colonel Abercrombie, about four in the morning, made a vigorous sortie against two unfinished redoubts occupied by the French, they spiked up seven or eight pieces of cannon, and killed several soldiers, but the French advanced and drove them from the redoubts, leaving several killed and wounded.

—Thacher, *Military Journal*,
pp. 341–43.

The same night that the allies took Redoubts Nine and Ten they worked feverishly to extend their second parallel to incorporate the captured works. By dawn on the 15th the task was finished—a remarkable twelve-hour accomplishment. Cornwallis valiantly continued his fight for survival, but the loss of the two redoubts was decisive. Furthermore, the position of the allied artillery improved considerably.

On the 16th a last-ditch effort by the redcoats to retreat to Gloucester across the York River, Long Island-style, failed. The next morning the allies bombarded the main British position with such force that the enemy's works began to collapse, rendering them incapable even of returning the fire. Thacher described the situation on the 17th:

> The whole peninsula trembles under the incessant thunderings of our infernal machines; we have leveled some of their works in ruins and silenced their guns; they have almost ceased firing. We are so near as to have a distinct view of the dreadful havoc and destruction of their works, and even see the men in their lines torn to pieces by the bursting of our shells. But the scene is drawing to a close.[18]

Later that same day a British officer carried a white handkerchief before the enemy lines. Firing ceased. By sunset terms of surrender had been exchanged. They were formalized the next day and signed officially two days later.

At two o'clock on the afternoon of 19 October 1781—allegedly to the tune "The World Turned Upside Down"—British troops marched slowly onto the Yorktown battlefield to lay down their arms before the assembled allied troops. "It was a noble sight to us," recalled Joseph Martin. "The British paid the Americans, seemingly, but little attention as they passed them, but they eyed the French with considerable malice depicted on their countenances."[19]

As Duportail was quick to point out and Washington readily acknowledged, officers in the Corps of Engineers and the companies of sappers and miners had made significant contributions to the siege. Afterward the Chief Engineer spoke highly of Colonel Gouvion—"great marks of satisfaction can scarcely be denied this officer." He further requested promotions for himself, Gouvion, and Capt. Etienne [Stephen] Rochefontaine, a French volunteer serving as an engineer since 1778, "according to the usages established in the European service."[20]

To Congress Washington wrote respectfully of Duportail:

> His judgment in council, and well-conducted valor in the field claim the highest applause, and have secured to him the esteem and confidence of the army. His plan and conduct of the late attacks in the . . . successful siege of York . . . afford brilliant proofs of his military genius, and set the seal of his reputation; while they entitle him to my warmest thanks.[21]

Gouvion, in the Commander in Chief's words, had acted "with that energy and precision which constitute the great Engineer."[22] Although Washington recognized that promotions for the three engineers who had served him at Yorktown might affect "the tranquility of the Army,"[23] he endorsed them.

13. WASHINGTON TESTIFIES TO THE ENGINEERS' DISTINGUISHED SERVICE

George Washington to the President of Congress.

Head Quarters near York, October 31, 1781

Sir

. . . I should conceal Sentiments with which I am very strongly impressed, and do Injustice to very conspicuous Merit, if I did not upon the present Occasion, offer my Testimonies to the distinguished Abilities and services both of Genl. Du portail and Lt. Colo. Gouvion; their Claim to the particular Attention of Congress, at this Juncture, is founded upon the practice of Europe; a Siege being considered as the particular province of the Corps of Engineers, and as entitling them, when attended with a Success, important in itself, and in its Consequences, to the great Military Rewards. These Officers besides are supported by a series of Conduct in the Line of the Department, which makes them not depend merely upon the present Circumstances. For these reasons I am induced to recommend Genl. Du portail's Memorial to Congress for the grades which he specifies, and the leave of Absence; the latter being by no means incompatible with the good of the Service at the present period, as I am reduced, notwithstandg. all my Efforts, to the Necessity of retiring into Winter Quarters.

—Fitzpatrick, *Writings of Washington*, 23:307–08.

The appeal succeeded. Duportail became a major general, Gouvion a colonel, and Rochefontaine—who would become Chief Engineer in 1794—a major. With Congress's blessings, Duportail and Gouvion hurried home to France to enjoy a much-deserved leave.

Duportail recommended that either the Chevalier de Laumoy or the Chevalier de Cambray-Digny serve as Chief Engineer in his absence. But since both were still prisoners, the Chevalier de Villefranche assumed command and retained it until Laumoy's release in August 1782. Duportail did not return until late that year. Kosciuszko remained in the Southern Department and Rochefontaine returned north with Washington.

After Yorktown Washington returned to West Point with the main elements of his Army, including the sappers and miners. Some two thousand regulars headed south to reinforce Greene, and Rochambeau's army regrouped at Newport. De Grasse had commitments in the West Indies and in early November, despite Washington's entreaties that he stay, the admiral sailed away.

In retrospect, the war was clearly over with the surrender at Yorktown, but in 1781 that fact was not immediately evident to the rebels. The enemy still held New York City, Savannah, Charleston, and Wilmington, North Carolina. After several months, however, events confirmed that the Yorktown defeat had indeed dealt the British the final decisive blow.

Chapter X

PLANS FOR A PEACETIME ENGINEERING ESTABLISHMENT

When the Revolutionary War ended Americans were faced with a perplexing decision: should they maintain a standing army in peacetime? They had a longstanding fear that armies threatened individual liberties and no tradition of a standing army. However, many citizens—led by a strong-willed group of nationalists in the Congress and most officers in the Continental Army—argued that the experiences of the Revolutionary War demonstrated the need for a change. To a man they believed the militia alone incapable of meeting the defensive needs of their new nation. Yet even this group stepped back from the traditional European idea of a large standing army led by a clique of aristocratic officers.

In April 1783, as the nationalists' influence waned, Congress appointed a committee to consider the thorny question. Alexander Hamilton, an avid supporter of a peacetime military establishment, served as chairman. The committee immediately called on General George Washington for advice. He in turn sought suggestions from his staff.

In the resulting reports there were many similarities. For each officer, a secure frontier assumed great importance. The west held the promise of the future but Indians and squatters were a constant menace. Hence armed forces were required to protect new settlers, and those forces had to be national in character. With Revolutionary War experiences fresh in their minds, Continental Army officers urged a "professional army composed of career officers trained in the science of warfare."[1] The continuing needs of frontier and coastal security, they argued, mandated a peace establishment which would form the nucleus of a much larger army in time of war.

Engineer officers were quick to recognize that the peacetime arrangements under consideration would require an engineering department and a means of training its officers. Happily the peace establishment proposals of four Army engineers—Duportail, Putnam, Gouvion, and L'Enfant—survive.

Chief Engineer Maj. Gen. Louis Duportail first addressed the subject of a peace establishment in a memorial dated April 1783. Unfortunately that document has disappeared. From statements made by Washington, however, it is known that Duportail proposed the "extensive" fortification of frontier posts and harbors and the establishment of military academies.[2] Duportail revealed that he had based the plan on "hints" Washington had given him while at headquarters. "I beg your excellency to let me know if i have been happy enough to meet with your ideas," Duportail told Washington when he sent the plan to him in May, "wishing not to propose anything to Congress but through you and what you approve of."[3]

When he finally saw Duportail's report, Washington exclaimed to the president of Congress:

> The more attention will be due to the sentiments expressed by . . . [Duportail] because they appear not only to be the production of a well informed mind, and the result of much experience, aided by great professional knowledge, but because they seem also to be dictated by a disinterested zeal for the future tranquility and happiness of the United States.[4]

The Commander in Chief passed on the report to Congress with the hope that Duportail's recommendations would be utilized "so far as they may be found practicable with our means, and applicable to our local circumstances."[5] Actually Duportail had submitted his plan to Congress even before showing it to Washington.

Col. Jean Baptiste de Gouvion, a top-ranking engineer, also contributed to the peace establishment debate. In a proposal dated 16 April 1783, Gouvion stressed the need for securing America's frontier and her harbors, and he favored a continental army over individual state establishments. He

JEAN BAPTISTE DE GOUVION. *One of three Royal Engineers the French government sent to America with Duportail, Gouvion (1747–92) distinguished himself during the siege of Yorktown. This engraving is by Jacques Cordier.*

Contenson, *Société des Cincinnati de France* focused on thorough training for artillerists and engineers, whose "Service is of So important a nature, and of Such a consequence in the field."

Gouvion deemed a military academy essential and detailed extensively its structure and the type of instruction required. Included in his proposed training program were rigorous field exercises as a prerequisite for entering a regiment.

Gouvion joined other engineer officers in urging that the artillery and engineers be united into one corps. He envisioned at least two regiments in the corps, each composed of companies of gunners, bombardiers, sappers and miners, and artificers. Of special interest is Gouvion's view that officers should only be detached as engineers after service in each of the four separate companies in the corps. The need to maintain a high degree of proficiency among officers through continual instruction and exposure to many experiences was a crucial consideration behind Gouvion's plan.

Gouvion was careful to note that France's attempt to unite the artillery and engineers had failed because it was done in time of war (1755–58) and the officers were unprepared to assume new roles. The French experience, then, was no reason to fear for the success of a similar move in the United States.

1. "AN OFFICER OF ARTILLERY AND AN ENGINEER WANT A GREAT APPLICATION TO BE PERFECTLY INSTRUCTED"

Jean Baptiste de Gouvion's recommendation for a peace establishment.

Newburg, April 16, 1783

How large must be the continental Army to be Kept after this war is not an easy matter to determine in the present moment, it depends from two different and distinct objects which comprehend a very extensive plan. The first is the number of forts absolutely wanting Garrison for the protection of the frontiers, and opposing the indians in case they would Keep up their hostile invasions or renew it at any time. The Second is the garrison of the harbours for the continental navy, which being destined to contain Stores of great value and importance, are not to lay open to an invasion in case the United States should happen to be at war with any power. . . .

Each regiment to be Kept or to be raised ought not to belong to any particular State, but to the continent at large, the officers and men to be taken indifferently from any part, it is to be feared that if the contrary did exist the officers would always use all their influence to be always stationed in the State they Should belong to, and in a Short time be like inhabitants to the great detriment of discipline and military Spirit.

A regiment or part of it ought never to keep garrison more than eighteen months in the Same place, in a longer length of time they get too many acquaintances, injurious to the Service, and being in a manner Settled neglect their duty to employ themselves about their own conveniences.

Promotion by Seniority is the destruction of emulation, because every officer is Sure to be promoted according to his rank, also many worthy officers are fit to be captains but not to be field officers. So that Sistem ought to be left aside. Merit, activity and attention constantly pay'd to instruction, duty and discipline must be the only recommendation for promotion above the rank of captain. A board of Superior officers be the Judge of it, and the necessary precautions to be taken to hinder private interest from prevailing.

As the number of troops Keept on foot during the time of peace Shall be inadequate to that necessary in time of war, they must be alwis in the best and most regular order, So that being destributed among the regiments raised for a war they Should bring with them discipline, instruction and enable the other men to perform in a Short Space of time every part of a Soldier's duty with propriety.

The young officers who Should be willing to acquire Some military knowledge ought to be permitted to follow the after mentioned military academy and proper encouragement given to them. Those to be admitted in the quarter master departement ought to be obliged to it, because it is not easy to perform their duty in all its different parts chiefly when an army of Some extent has to move in a difficult country.

It is not very difficult to form an officer of foot, or of horse, it does not require a long Space of time, but an officer of Artillery and an Engineer want a great application to be perfectly instructed in all the different branches of their Service. Being more acquainted with the duty of these two Corps than of any other I will particularise as much as in my power the different methods to be followed for the instruction of their officers, and the regulations to be established to attain it. Their Service is of So important a nature, and of Such a consequence in the field, that no pains ought to be Spared to have them fully acquainted with the theorical and practical parts of it.

The military operations of these two corps have Such a connection that it is not possible to be a good officer of Artillery without having a pretty extensive knowledge of the Service of an Engineer, and this one to Serve with Some reputation must be acquainted with the principle parts of the artillery Service. Then I think it Should be advantageous to the good of the Service to have these two corps united, to form one only, and that each officer Should acquire the necessary Knowledge to be able to perform, with propriety what belong to one or the other of these two duties, according to what circumstances Should require from him.

A well established military academy and Kept up with great care, is the basis which is to Serve to raise that corps to the pitch of instruction necessary to it. Officers of Knowledge, carefull and attentive must be put at the head of it. They must consider that the pains they Shall take are to form officers who are to have charge after wards of important operations, which require Sometimes great military talents. There must be attached to it a good professor of mathematicks, and another of drawing. Every young gentleman to be admitted in the Said academy must have had a liberal education, and be previously instructed in arithmetick, geometry including trigonometry. At his coming in, his Knowledge of mathematicks must be carry'd to perfection, he Shall receive instruction about the different machines employed by the artillery or the engineers; their construction; the forces to be employed to put them in motion, and their effect. He Shall be taught to Survey by every method, and to draw exactly the ground Surveyed by him, to make plans and profils of the works and buildings in the greatest detail. The above mentioned parts belong entirely to the professors. What follows must be [taught] by the commanding officers.

The young gentlemen Shall be instructed how to choose positions for an army in consequence of the part of the country to be covered and the communications to be Kept open. They will learn to fortify them by field works depending from the nature of the ground, the number of troops Supposed to be employed to deffend them, and the Strength of the enemy. They Shall be taught to determine the most advantageous batteries on a field of battle, and their construction in the most expeditious manner. They are to be instructed in the greatest detail of all what relates to fortify'd towns including the maritime places, their tracing, construction, and the estimate of the quantity of work and expences. Those parts can not be attended to with too much care, because the least blunder is often attended with infinite bad consequences. They Shall receive instruction concerning the Subterraneous fortification, the attack and defense of works by the means of mines. They Shall be taught how to reconnoitre an enemy's fortification, lay it on the paper, and determine exactly the different distances from it. Every year the commanding officer of the Academy Should make choice of a piece of ground fit to lay out a front of fortification, the direction and the height of the works should be mark'd with poles. He should explain to the young gentlemen, the use of each part of it, and the reasons which have determined the direction of it. That part being finished they will proceed to the attack of it. All the batteries and works necessary from the opening of the trenches to the reduction of the place are to be lay'd out, and Some parts of it to be done to give them an idea of the different construction made use of in those occasions. They will pay a particular attention to the advantages afforded by the nature of the ground, also to the means the besieged could employ to oppose the approaches with Success. That being performed every young gentleman is to Survey that front and its attack and make a copy of it, also a memorial on its construction, its attack and defense, adding to it an estimate of the artillery Stores, and ammunitions necessary for the besieged and besiegers in consequence of the Strength of the fortification, and of the Supposition of the time the Siege would last. When perfectly instructed in all the different parts here above mentioned, of which the General commanding the corps, and the officers at the head of the academy are to be the Judges he is to be admitted into one of the regiments of artillery. The continent cannot Keep less than two, and are to be composed as follows. Eight companies of gunners, two companies of bombardiers, one of Sappers and Miners and one of Artificers.

The regiments are to be exercised twice a week to the firing of canon, mortars, etc., a field officer to be alwis present and report to the Commanding officer of the regiment when absent from the field of exercise.

The Subalterns ought to receive twice a week a lesson about the theorical parts of the artillery and a captain to be present to it to maintain the good order and preside to the instruction, and from time to time they Should be exercised again about what they have learned in the Academy. The Captains and field officers ought to have two times a week a conference where they Should treat of all the parts concerning artillery, fortifications, manufactures of arms, powder mills, castings of canons, Shells, balls, the best dimensions to be given to the pieces and carriages, in Short their object Should be to carry the instruction and Service of that corps to the greatest perfection. The Commanding officer should ask a memorial from every officer on the interesting points he would have proposed for discussion.

Besides the officers on duty with the regiments there Should be a certain number to perform the duty on Engineers where necessary, but none Should be Sent for that purpose unless he had been employ'd Successively in the four distinct Sorts of companies forming a regiment, and Should be perfectly acquainted with their Service. He could not be on that command for more than three years, after which time he Should join a regiment and be relieved by another officer Sent to the Same effect.

A company ought not to be detached from the regiment for more than two years, because it is to be feared that (in a longer Space of time) the men would loose the greatest part of the instruction acquired with the regiment, if too a long time absent from it.

The companies of Sappers and miners should have a particular exercise relative to their duty in the field, but their officers Should also partake of the general instruction of the corps of artillery.

It is absolutely necessary that the officers of the companies of artificers Should be intelligent, attentive, and industrious. They ought not only take rank with those of the others companies, but their places Should be considered as places of trust and confidence.

There ought to be Some officers (extra of the number of those with the regiments) detached in the different manufactories of arms, places for casting canons, and powder mills, to Superintend the works. They Should be relieved from time to time by others coming from the regiments. Those stations are to be looked upon as of great importance.

A field officer Should be in every district at the head of the fortifications, and Judge of every thing to be proposed, he could not remain there when promoted but Join a regiment.

It is of the utmost consequence that an officer of artillery attached to a brigade with Some field pieces, Should be perfectly acquainted with the different manoeuvres of the troops, So it is a part which is not to be neglected.

The plan I propose here to form but one corps of those of artillery and Engineers was put in execution in france, but as it was in time of war Some Engineers were sent to the Army to do the duty of the Artillery, and Some officers of artillery to Serve as Engineers, but having not had time to be perfectly acquainted with the details of a Service of which they had but a general Knowledge, it was found proper after a little while, to let every one of these officers Serve in the line they formerly belong to, and the two corps were disunited. But I am confident that if the reunion had taken place in another circumstance, So that the officers of each corps Should have had time to acquire what Knowledge was wanting to them of the Service they did not at first belong to; that plan would have Succeeded, and found afterwards very advantageous.

—Washington Papers, roll 91.

Brig. Gen. Rufus Putnam, Duportail's predecessor as Chief Engineer, joined Gouvion in advocating fortification of America's seaports and frontiers. Putnam even specified five ports whose defense Congress should control. He chose them for strategic reasons rather than for their size and commercial importance. The remaining harbors were deemed safe in the hands of the states.

Putnam singled out the Lake Champlain–Hudson River corridor for congressional attention. He saw West Point as the "Grand Arsanal of America," where the art of gunnery and fortification would be taught and from which companies of artillery—he did not specifically mention the engineers—would be detached to the field. To the west on the Ohio River he proposed a chain of eight posts designed to make the Indians submissive and encourage settlement—a venture Putnam was soon to become personally involved in.

2. "AMONG THE SEA PORTS, NEW YORK CLAIMS THE FIRST ATTENTION"

Rufus Putnam's thoughts on a peace establishment.

April 25, 1783

America is by no means to place her principle Security in walled Towns and the Multitude of her Fortresses, *nor* is she in time of Peace to be at the expence of a reguler Army Sufficient for the defence of every part of her Territorys, Should they be invaided. Yet unless her harbours (at least the principle ones) are Secured by Fortifications and Small Garissons, her Sea Ports are liable to be Surprised, plundered and burnt, or laid under contributions by a few Ships of War; and if aided by land Forces an Enemy might in some of them, So establish him Self in a very Short time as to render it very [difficult] to drive him out.

Her frontiers, Should also be So Secured, by Forts and Garisons in such maner as at least might retard the opperations of an Enemy till the Force of the country may be collected to oppose him.

Among the Sea Ports, New York claims the first attention, No Spot on the Continent the possession of which is of So much consequence to the United States as that, and with a very little expense, compared with the object, may be rendered perfectly Secure against any Surprise or Insult whatever.

Falmouth [modern-day Portland] in the province of Main is the next Harbour eastward that ought to claim the attention of Congress. It is in the very Neighbourhood of Halifax.[6] The Country but thinly Settled the Harbour is deep and Spacious, the Town on a peninsula, and Should an enemy establish him Self there the whole eastern Country would be in danger of being lost.

Penobscot . . . is Still further east has also a Spacious Harbour and is the Source, I am told, from whence the eastern States are to expect the most of their Masts Spars and Lumber. There are also in the Back Country Several Tribes of Indians.

From New york Southward Charles Town and Savanna are the first I suppose Intiteled to the Notice of Congress, they have the Spaniards on their Right and Savages in the Rear, are properly the Frontier, on the quarter and I am told the Country is but thinly peopeled.

Their are other Harbours and Sea ports of very great consequence but I think they will be perfectly saif in the hands of the States, to which they beiong and Should Congress Interfeir in the matter it might give very grate Jealousy at least to Some of them.

In point of Importence Next to the Citty and Harbour of New york, the North River and the Commun[ication] between New york and Canada ought to Claim the first attention, for whoever attempts the Conquest of

America will in my opinion, if he acts right, endever to Establish him self on the Hudson and by a chain of Posts in that quarter to Seperate the eastern from the midle and Southern States, on this . . . then Congress Should always keep an eye and Never Suffer an enimy, Foreign or domistic to fix himself on any part of it.

West Point is perhaps as well Sittuated for the Grand *Arsanal* of America as any place whatever and by dismanteling most of the out works, a much Smaller Garison will be required then in its present State, this Garison should consist Chiefly of Artillery men and Include also one Company of Artificers. Here Should all the Carage and apperatis for the artillery be made, here should the Art of Gunnery and Fortifications be Taught, and from hence Should the artillery Companys detached to other posts be releved at least once in three year. Besides West Point there will undoubtedly be other Arsinals established both east and West that will require Small guards.

I consider Stoney point as an appendage to West Point whither the former remain in its present State or a reguler Fortification be built there; which is a Subject worth consideration.

In order to prevent a [surprise] from Canada by way of Lake Champlain, if the Sittuation will admit a Fort Should be built at Wind mill Point or Point au Feir, or Some where near the Forty fifth degree of Lattitude and the River or Lake so obstructed as forever to Shut the British out of it. This matter I concive to be worth attention and examenation, for if practicable *then* in case of a War with Great Briton it will prevent their makeing them Selves masters of the Lakes and at the Same time it will give great Security to . . . that part of the Country called the Hanphere [Hampshire] Grants [Vermont] and other Setlers Near the Lake and will also aide us in Introduceing an Army into Cannada when ever that Should be thought proper. In the mean time it will be a means of checking any Illicit trade in that quarter, interrupt the wicked Corrispondence and be a good means to prevent the revolt of the Virmonteres Should they have it in Contemplation.[7]

But if no place can be found Sutable for a Fortification further Northward, then Crown Point *then* that Should be fixed on. The Lake is Narrow here its pasage esily obstructed, and the Sittuation elligable for an Independent Strong Work of any Size you please.

The Necessity of a Fortress Some where on Lake Champlain to prevent any Sudden Eruption from Cannada into the provence of New york I think is obvious and if one is established there, Some Intermediate Posts will be necessary between that and Albany for the Lodgement and Security of the Stoars that may be Sent northward, viz, one at Fort George and another at the Landing at the further end of Lake George but a Block House or even a Stockade with a very few Troops as a Guard will be Sufficient.

Albany will no Doubt requier Some Troops as it will be the place for Lodging at least for a time the Stores designed for the Northern and We[stern] Fronterrs.

To keep the Western Savages in Awe to protect and regulate our Trade with them and prevent any insidious practices of our British and Spanish Neighbours as far as posable, Some Fortresses and a Small reguler Establishment is absolutely necessary.

The British Used to Send their Supplys to Niagara from Canada, of course are under no necessity of keeping a Post at Oswego, but in our present Sittuation I concieve that all our Supplys for the Country on the Lakes must pass that way, and besides in order to protect the ... [French] Settelments above Detroit, Encourage their emigrations from Cannada and Secure the posts in that Quarter from Surprize our Force Should be much greater even in time of peace then what the British Used to keep. They had only the Savages to guarde against we have them and the Savages Both to look to.

If we wish to Secure the people of Illinois from the Surprize of the Spaniards our Force There Should always be equal to theirs.

To Secure the Communication between Fort Pitt and Illinoise to give Protection to the Inhabitents . . . on the warters of the Ohio to awe the Southern Indians and check any attempt that may be made up that River I belive Several Small Post on or near the Ohio will be found Necessary. Perhaps the place where Fort Massac Stood, 46 miles from the Mouth of the Ohio, may be found a proper Spot for one of those Intermediate posts.

In time of War a Navel Superiorety on the Western Lakes may be more likely to fall to the Share of the British then to us, or at least the Superioriety is uncertain. I wish therefore to Suggest the propriety of opening Some other Communication with Lake Erie, then that through Lake Ontario, by which Niagara Detroit, etc., etc., may recive Supplys in case of Necessity, for besides the Idea of the British haveing a Navel Superiorety in Lake ontario Should Niagara by any Misfortune be taken with it we must loose the whole Western World, unless Some other Communication is opened with it then at present.

This Communication may be made from Fort Pitt to Presque Isle, but I think the Most Elligable is From Fort Pitt by Big Bever Creek Kishkuske and Cayahoga or Down the River from Fort Pitt to yallow Creek from thnce by Tuscarawas to Cayahoga and Lake Erie.

But I wish to propose for Consideration a much more exten[sive] plan attended with very little additional expence and when considered in an extensive point of vew I concieve to be of very great consequence, Viz to fix a post at the mouth of the Cayahoga River; a 2d at the one mile portage between the Heads of the Cayahoga and Muskingum Rivers; a 3d at Tuscarawas; a 4th at the Forks of Munkingum; or Delleware Town; a 5th near Wills Town; a Sixth near the Mouth of Muskingum; a 7th near the Hockhocking; an 8th on the Great Kanhawa. Some Such Chain of Posts in that Quarter I concive would give Such Encouragement not only to those who have lands on this Side the ohio but also to Such as may obtain grants on the other Side as would Induce Such Emigrations to that Quarter, that within a few years the Country West of the Allegheny Mountains would not only be able to feed all our Garisons in the Western World, but render that Frontear perfectly Secure. The Savages about the Waters of the Mohawk Susquehannah Oswego and Ohio when they See them Selves encompassed with forts and garisons would undoubtedly behave very Submissive or move further afeild.

The expence of Building these Posts will be very Small, a good Stocade with proper Flankers will be abundently Sufficient in all instences except the one at the Mouth of the Cayahoga, which will require more attention, Nor will it require any Considirable, if any, increase of Troops as Fort Pitt and some other Posts will require a less number in this case then would be other wise necessery. . . .

—Washington Papers, roll 91.

Several officers outside the Corps of Engineers also recognized the need for officers trained in the art of war. Brig. Gen. George Clinton, governor of New York, proposed that professorships in military science be set up in each state to assure a continual "succession of officers well versed in the tactics of war."[8] By contending that officers must attend a stated number of courses and lectures and be admitted to degree candidacy *before* receiving their commissions, Clinton envisioned a highly professional army.

In his peacetime recommendations, Col. Timothy Pickering—a student of military history and tactics, author of a 1775 drill manual, one-time adjutant general, and later quartermaster general—acknowledged a limited need for engineers. He also favored a military school at West Point.

3. "AS MANY AS TWO ENGINEERS WILL PROBABLY BE ALWAYS FOUND NECESSARY"

Timothy Pickering to George Washington.

April 22, 1783

. . . For the purpose of fixing the posts on the frontiers, it will be necessary to retain two or three engineers; each of whom, having a separate duty, should be accompanied, on this service, by an officer of ability. These may be field officers, and vested with the Command of the standing troops, who may be formed into one regiment of four battalions; the regiment to be commanded by a colonel or lieutenant colonel, and each battalion by a lieutenant colonel or major. . . . To erect these posts in the first instance, a competent number of the three-years-men[9] will doubtless be retained in service, unless others can be engaged on cheaper terms.

As many as two engineers will probably be always found necessary, for visiting the posts and repairing fortifications or erecting new ones as circumstances shall require.

It is hardly to be expected that the arsenals will be constantly kept in proper order, unless they are subject to visitations, at least annually. The visitor may most properly be an artillerist, who is both practically and scientifically acquainted with his profession. He may be one of the field officers of the regiment. For I see no necessity keeping the infantry and artillery distinct. . . .

If anything like a military academy in America be practical at this time, it might be grounded on the permanent military establishment for our frontier posts and arsenals; and the wants of the states, seperately, of officers to command the defences on their seacoasts.

On this principle it might be expedient to establish a military school, or academy, at West Point. And that a competent number of young gentlemen might be induced to become students, it might be made a rule that vacancies in the standing regiment should be supplied from thence. Those few instances excepted where it would be just to promote a very meritorious sergeant.

For this end the number which shall be judged requisite to supply vacancies in the standing regiment must be fixed; and the students who are admitted with an expectation of filling them limited accordingly. They might be allowed subsistance at the public expense. If any other youth desired to pursue the same studies, at the military academy, they might be admitted, only subsisting themselves. Those students whould be instructed in what is usually called military discipline, tactics, and the theory and practice of fortification and gunnery. The commandant and one or two other officers of the standing regiment and the engineers, making West Point their general residence, would be the masters of the academy; and the inspector general superintend the whole. . . .

—Washington Papers, roll 91.

Having weighed the advice of his staff, Washington submitted his own peace establishment plan to Hamilton's committee on May 2. At the time the Commander in Chief was "quite in the dark" regarding all aspects of the future of the Army in the United States.[10] He sincerely hoped that the Congress would at least heed some of his suggestions, which drew heavily on the proposals made by his advisors. His plan was "an even-handed document, mindful of the country's deeply ingrained suspicions of men in uniform."[11]

For Washington the issue was one of scale. A large army was "dangerous to . . . liberties" but a small force was "indispensably necessary." He set officer and troop requirements at 2,631. In one part of his proposal, not included below, Washington stipulated that four regiments of infantry, each comprising 477 men, would be garrisoned at fifteen specific locations elsewhere and at an undetermined number of posts on the Carolina and Georgia frontiers. He placed the remaining 723 men in a single artillery regiment. Washington proposed that an additional force of artificers be blended with the artillery and that the Corps of Invalids be retained to help guard magazines and garrison West Point.[12]

As demonstrated in the following selections from Washington's plan, he supported the union of the artillery and engineers into one corps. More important, he strongly urged the establishment of at least one academy "for the Instruction of the Art Military; particularly those Branches of it which respect Engineering and Artillery, which are highly essential, and the knowledge of which, is most difficult to obtain." Military education is crucial, he said, "unless we intend to let the Science become extinct, and to depend entirely upon the Foreigners for their friendly aid."

The Commander in Chief was acutely aware that most of his best engineers during the Revolution were foreigners with formal training. Indeed, in a letter written earlier to Duportail, Washington had admitted that "it will doubtless be necessary for us to retain some of the French Engineers in America," at least while the proposed military academies and manufactories were in their infancy.[13]

That Washington dispatched his peace establishment plan to Congress before receiving a copy of Duportail's recommendations for the engineering department probably accounts for Washington's sketchy references to the engineers.

4. "A CORPS OF ABLE ENGINEERS . . . CANNOT BE RAISED IN A DAY"

George Washington's sentiments on a peace establishment.

May 2, 1783

A Peace Establishment for the United States of America may in my opinion be classed under four different heads Vizt:

First. A regular and standing force, for Garrisoning West Point and such other Posts upon our Northern, Western, and Southern Frontiers, as shall be deemed necessary to awe the Indians, protect our Trade, prevent the encroachment of our Neighbours of Canada and the Florida's, and guard us at least from surprizes; Also for security of our Magazines.

Secondly. A well organized Militia; upon a Plan that will pervade all the States, and introduce similarity in their Establishment Manoeuvres, Exercise and Arms.

Thirdly. Establishing Arsenals of all kinds of Military Stores.

Fourthly. Accademies, one or more for the Instruction of the Art Military; particularly those Branches of it which respect Engineering and

Artillery, which are highly essential, and the knowledge of which, is most difficult to obtain. Also Manufactories of some kinds of Military Stores.

Upon each of these, and in the order in which they stand, I shall give my sentiments as concisely as I can, and with that freedom which the Committee have authorized.

Altho' a *large* standing Army in time of Peace hath ever been considered dangerous to the liberties of a Country, yet a few Troops, under certain circumstances, are not only safe, but indispensably necessary. Fortunately for us our relative situation requires but few. The same circumstances which so effectually retarded, and in the end conspired to defeat the attempts of Britain to subdue us, will now powerfully tend to render us secure. Our *distance* from the European States in a great degree frees us of apprehension, from their numerous regular forces and the Insults and dangers which are to be dreaded from their Ambition.

But, if our danger from those powers was more imminent, yet we are too poor to maintain a standing Army adequate to our defence, and was our Country more populous and rich, still it could not be done without great oppression of the people. Besides, as soon as we are able to raise funds more than adequate to the discharge of the Debts incurred by the Revolution, it may become a Question worthy of consideration, whether the surplus should not be applied in preparations for building and equipping a Navy, without which, in case of War we could neither protect our Commerce, nor yield that Assistance to each other, which, on such an extent of Sea-Coast, our mutual Safety would require.

Fortifications on the Sea Board may be considered in two points of view, first as part of the general defence, and next, as securities to Dock Yards, and Arsenals for Ship Building, neither of which shall I take into this plan; because the first would be difficult, if not, under our circumstances, impracticable; at any rate amazingly expensive. The other, because it is a matter out of my line, and to which I am by no means competent, as it requires a consideration of many circumstances, to which I have never paid attention.

The Troops requisite for the Post of West Point, for the Magazines, and for our Northern, Western and Southern Frontiers, ought, in my opinion, to amount to 2631 Officers of all denominations included; besides the Corps of Invalids. If this number should be thought large, I would only observe; that the British Force in Canada is now powerful, and, by report, will be increased; that the frontier is very extensive; that the Tribes of Indians within our Territory are numerous, soured and jealous; that Communications must be established with the exterior Posts; And, that it may be policy and economy, to appear respectable in the Eyes of the Indians, at the Commencement of our National Intercourse and Traffic with them. In a word, that it is better to reduce our force hereafter, by degrees, than to have it to increase after some unfortunate disasters may have happened to the Garrisons; discouraging to us, and an inducement to the Enemy to attempt a repetition of them. . . .

That an Institution calculated to keep alive and diffuse the knowledge of the Military Art would be highly expedient, and that some kinds of Military Manufactories and Elaboratories may and ought to be established, will not admit a doubt; but how far we are able at this time to go into great and expensive Arrangements and whether the greater part of the Military Apparatus and Stores which will be wanted can be imported or Manufactured, in the cheapest and best manner: I leave those to whom the observations are to be submitted, to determine, as being more competent, to the decision than I can pretend to be. I must however mention some things, which I think cannot be dispensed with under the present or any other circumstances; Until a more perfect system of Education can be adopted, I would propose that Provision should be made at some Post or Posts where the principle Engineers and Artillerists shall be stationed, for instructing a certain number of young Gentlemen in the Theory of the Art of War, particularly in all those branches of service which belong to the artillery and Engineering Departments. Which, from the affinity they bear to each other, and the advantages which I think would result from the measure, I would have blended together; And as this species of knowledge will render them much more accomplished and capable of performing the duties of Officers, even in the Infantry or any other Corps whatsoever, I conceive that appointments to vacancies in the Established Regiments, ought to be made from the candidates who shall have completed their course of Military Studies and Exercises. As it does in an essential manner qualify them for the duties of Garrisons, which will be the principal, if not only service in which our Troops can be employed in time of Peace and besides the Regiments of Infantry by this means will become in time a nursery from whence a number of Officers for Artillery and Engineering may be drawn on any great or sudden occasion.

Of so great importance is it to preserve the knowledge which has been acquired thro' the various Stages of a long and arduous service, that I cannot conclude without repeating the necessity of the proposed Institution, unless we intend to let the Science become extinct, and to depend entirely upon the Foreigners for their friendly aid, if ever we should again be involved in Hostility. For it must be understood, that a Corps of able Engineers and expert Artillerists cannot be raised in a day, nor made such by any exertions, in the same time, which it would take to form an excellent body of Infantry from a well regulated Militia. . . .

—Fitzpatrick, *Writings of Washington*, 26:374–76, 396–97.

Issued in mid-June 1783, the Hamilton Committee report indicated the extent to which the remaining nationalists in Congress shared the Army officers' views. The committee both affirmed the need for fortifications and argued for a federal establishment to maintain them. The wording of the report clearly indicates the supporters' political hopes that the peace establishment would help achieve national cohesion. The committee also heeded arguments made by Washington and assuredly reiterated by Duportail as well: a corps of artillery and engineers was a peacetime necessity.

As the committee saw it, the corps required "science and long preliminary study" and could not be simply thrown together in response to an emergency. Moreover, the fortifications proposed on the frontier and along the coast required the skills of artillerists and engineers. Without an established engineer and artillery branch, the Army would be in the disadvantageous position of employing foreigners in wartime. The committee recommended combining the two groups into a single unit—called the corps of engineers—in part because separation gave "rise to frequent disputes about the respective duties of each."

The Hamilton Committee report outlined the corps's structure and laid down a few regulations. Believing that Duportail's recommendations were "in general sound and just," the committee proposed that the Chief Engineer survey the sites to be fortified and draw up a general plan to carry out the work. Notably the congressmen rejected the idea of a military academy. They maintained that having professors attached to the corps of engineers was sufficient.

The Chief Engineer, who would be paid $250 plus subsistence each month, was to be one of three members of the general staff and as such was to assist in revising Army and militia regulations. As for the corps of engineers in general, both its pay and the number of officers in proportion to troops would be higher than in other units.

5. REPORT OF A COMMITTEE OF CONGRESS ON A MILITARY PEACE ESTABLISHMENT

Philadelphia, June 18, 1783

The Committee, are of opinion, if there is a contitutional [*sic*] power in the United States . . . , that there are conclusive reasons in favour of federal in preference to state establishments.

First there are objects for which separate provision cannot conveniently be made; posts within certain districts, the judisdiction [*sic*] and property of which are not yet constitutionally ascertained—territory appertaining to the United States not within the original claim of any of the states—the navigation of the Missippi and of the lakes—the rights of the fisheries and of foreign commerce; all which belonging to the United

States depending on the laws of nations and on treaty, demand the joint protection of the Union, and cannot with propriety be trusted to separate establishments.

Secondly, the fortifications proper to be established ought to be constructed with relation to each other on a general and well-digested system and their defence should be calculated on the same principles. This is equally important in the double view of safety and economy. If this is not done under the direction of the United States, each state following a partial and disjointed plan, it will be found that the posts will have no mutual dependence or support—that they will be improperly distributed, and more numerous than is necessary as well as less efficacious—of course more easily reduced and more expensive both in the construction and defence.

3dly. It happens, that from local circumstances particular states, if left to take care of themselves, would be in possession of the chief part of the standing forces and of the principal fortified places of the union; a circumstance inconvenient to them and to the United States. . . .

4thly. It is probable that a provision by the (Congress) of the forces necessary to be kept up will (be based) upon a more systematic and economical plan than a provision by the states separately. . . .

5thly. There must be a corps of Artillery and Engineers kept on foot in time of peace, as the officers of this corps require science and long preliminary study, and cannot be formed on an emergency; and as the neglect of this institution would always oblige the United States to have recourse to foreigners in time of war for a supply of officers in this essential branch—an inconvenience which it ought to be the object of every nation to avoid. Nor indeed is it possible to dispense with the service of such a corps in time of peace, as it will be indispensable not only to have posts on the frontier; but to have fortified harbours for the reception and protection of the fleet of the United States. This corps requiring particular institutions for the instruction and formation of the officers cannot exist upon separate establishments without a great increase of expence.

6thly. It appears . . . to be the concurrent opinion of the Commander in Chief, the Secretary at War, the Inspector General and the Chief Engineer, not only that some militia establishment is indispensable but that it ought in all respects to be under the authority of the United States as well for military as political reasons. The plan hereafter submitted on considerations of economy is less extensive than proposed by either of them.

The Committee upon these principles submit the following plan.

The Military peace establishment of the United States to consist of four regiments of infantry, and, one of Artillery incorporated in a corps of Engineers, with the denomination of the corps of Engineers. . . .

The Corps of Engineers to consist of one Regiment or two batalions of Artillery, each batalion consisting of four companies, each company of sixty four rank and file; and of a corps of Artificers. . . .

The promotion in the Engineers to be distinct and according to seniority in that corps.

Provided that no officer whatsoever shall consider it as a violation of his rights, if another receives an extra promotion in the corps on account of brilliant services or peculiar talents.

And in order that such extra-promotion may not depend on misrepresentation, it shall not be made but on the recommendation of the Commander of the army, accompanied by the facts and reasons upon which it is founded, and with the opinion of the officer commanding the corps in which the promotion is to be made, all which shall be reported to Congress, by the secretary at war with his opinion concerning the same.

All non commissioned officers and privates to be engaged for six years; with this condition that if a war should break out during the time, they shall be obliged to serve to the end of it.

Fortifications

The fortifications necessary to be kept up are of two kinds, land and naval; the first for internal security the last for the protection of the fleets of the United States.

As to the first kind, there are many important posts already existing, several of which it will be essential to occupy and guard 'till more permanent provision can be made on a general plan. For this Congress have already made temporary provision by their resolution of the [*blank*]. If the time therein limited should be likely to expire before a general system can be adopted, it can be prolonged.

The Committee are of opinion that the principles laid down by Major General Du Portail, Chief Engineer, in . . . [his peace establishment memorial] annexed to this report, so far as they respect merely the article of fortifications are in general sound and just; and that it will be expedient for Congress, so soon as they have determined on the establishment of the corps of Engineers, to instruct the head of that corps to make a survey of the points proper to be fortified and to digest a general plan proportioned to the military establishment of the United States to be laid before Congress for their consideration. . . .

Military Academies

The Committee are of opinion that the benefit of such institutions rarely compensates for the expence—that military knowledge is best acquired in service, that with respect to those branches of service which are of a more scientific nature, the professors proposed to be attached to the corps of Engineers, will produce substantially all the utility to be expected from academies—that at all events institutions of this kind can only be an object of future consideration. . . .

General Staff

The Committee are of opinion that a general staff in time of peace (except a General officer to command the troops another to command the corps of Engineers and Artillery and an Inspector General) ought to be dispensed with as all the purposes may be answered by the war department, by contracts, and by the Regimental staff.

The pay of the officers here mentioned and other emoluments to be as follows: General Commanding the troops—300 dollars pay per month; General commanding Engs—250 dollars per month pay and subsistence; Inspector General—250 dollars per month pay and subsistence.

In time of war two Regiments to compose a Brigade and a Brigadier General to be appointed to each brigade with 200 dollars pay per Month and 5 rations of forage per day. . . .

The Committee are of opinion that with a view to either of the proposed establishments, it will be proper to direct the Commander in Chief to appoint a board of officers, the Inspector General, Commandant of Artillery and Chief Engineer being members, to revise the regulations for the army of the United States, and to digest a general ordinance for the service of all the troops of the United States, and another for the service of the militia; and to transmit both with his observations to Congress for their consideration; the latter when approved to be recommended to the several states. . . .

Remarks

A. Corps of Engineers. The artillery and Engineers are united in one corps from the great analogy in the service which when the corps are separated gives rise to frequent disputes about the respective duties of each, very injurious to the service; there is a great resemblance in the preliminary studies and qualifications requisite to form the officers of both, and the Union is conducive to economy. There is an extra number to serve as Engineers.

B. The pay of this corps is generally higher than of any other; because there is much preparatory study and labour to qualify an officer, and promotion is much less rapid.

C. There are a great number of officers in proportion to the men; because artillery are chiefly in detachments and are of so much consequence in military operations that the pieces ought rarely to be trusted to non commissioned officers. . . .

—Syrett, *Papers of Hamilton,* 3:381–83, 387, 389–92, 395–96.

While the Hamilton Committee had acted with speed to submit its final report in June the full Congress—increasingly antinational in sentiment—balked. Even a visit to Congress by Washington in late August failed to get results.

Meanwhile, Washington went ahead with plans to transfer British-held forts to American custody. He sent Maj. Gen. Baron von Steuben to Canada to confer with General Frederick Haldimand, the British commander. Jean Louis Ambroise de Genton, the Chevalier de Villefranche, who accompanied von Steuben, recorded his own observations regarding existing British works and plans for peacetime fortifications on Lake Champlain. In his report Villefranche, a lieutenant colonel in the Corps of Engineers, apparently agreed with Rufus Putnam's assessment: the Lake Champlain—Hudson River corridor remained as crucial in peace as it had been in war.

6. VILLEFRANCHE'S OBSERVATIONS ALONG THE ROUTE TO CANADA

The Chevalier de Villefranche to George Washington.

West point, September 17th, 83

Sir:

I have the honor to send to your excellency my observations while with general baron de steubens; they are very counteracted, and besides i cannot warant their exactness, owing to the general being in a very great haste, to get to Canada, we did not stop to any of those positions on lake champlain which it had been very interesting to examine; and i was not permitted to go on Shore at *l'isle aux nois* and st. john. . . .

Observations. Of all the positions that i have seen on lake champlain, it appears to me that wind mills' point is the only one advantageous to be fortify'd, in order to deffend its entrance. At that place it is but about one mile wide, i Could not be inform'd exactly were the chanel passes, but in supposing it to be in the middle, the distance would not be too great to gall very much the ships at their passage under the firing of the works that might be erected there.

As far as i Could guess wind mills' point advances about three quarters of a mile into the lake, its foremost part is about 7 or 800 yard broad and become narrower as it joins the Continent; there is no Commanding ground round that position, the Country at that place is very level, and i was told that in great increases of water it is overflowed at a very Considerable distance, excep the point, which never is from wind mills' point to the 45°.[14] The lake grow narrower and the Country is very level, perhaps would it be more advantageous to take a position more advanced, principally if the channel passes near its banks, it is what i could not be informed of.

At about 8 miles this side of wind mill's point is *l'isle la motte,* the northerly point of that island is but about 1 1/4 of a mile distant from the southern part of *point au fer* between those two points, is a small island which is not marked on the chart; the East channel of *l'isle la motte* is but about 500 yards distant from its northern point; if this point that of *point au feu,* were fortifyed and a battery erected on the above mention'd island, it would render it very difficult for vessels to go up the lake.

The British have two posts this side of the 45°. The first on *long isle* at a place Call'd dutch mans point. From the informations i have taken (for we did see the works but at a distance of at least 4 miles) i have learn'd that they have only a strong Block house where are no other troops but refugees Commanded by a doctor smith, they have there well built Barracks for about 800 men.

The second post is at *point au fer,* at about 3 miles this side of *wind mills' point,* it is very trifling, it Consist in a stone house at the 4 angles of which they have erected tambours. The whole is surrounded by palissade in a square form, at the angles of which are small bastions made of palisade tow.

Beyond the 45° [in Quebec Province] the 1st post you meet with is on *l'isle aux nois* before this war it was allmost nothing, but it seems that the British will now make of it one of their main forts. . . . *L'isle aux noix* is small, extremely flat as well as the opposite shores, the northern part of it swampy. Small boats Can only pass on the west side, the ship channel is on the East. The old fortifications which . . . stand . . . are in a Very tattered situation, they Consist in a [sodded] fort situated in the middle of the island, it is surrounded with block houses; they are Erecting three redoubtes at this time; . . . two on the East and one on the west side, those redoubts are built with timbers, and seemed to me to be 15 or 20 feet high and Each large enough to Contain 3 or 400 men. They are allmost Compleated. The British have at that place large magazins, and Barracks for 1500 men. Having taken my observations from on board of the ship where i was i Cannot warrant for the absolute exactness of them.

St. john is the 2d. post on the river chambly, it appears to me that it is very much neglectected [*sic*]. It Consist in two soded redoubts with several planked embrasures, they are situated on the Bank of the river; i was told that they were joind by palissade at the beginning of this war, but it remain nothing of it. It appeared to me that St. john on the land side is surrounded with pickets with a parapet behind it 3 or 4 feet thick; the Country round seems to be very flat. I can't say no more of it being on board of a ship from which it was allmost impossible to see any thing.

Chambly is the 3d. post on the river. It is but an old Castle flancked with 4 tours 30 or 35 feet high. The walls are not more than 3 feet thick, it is of no deffence against artillery; it was formerly built just to deffend against indians. 300 men may be lodged in that Castle.

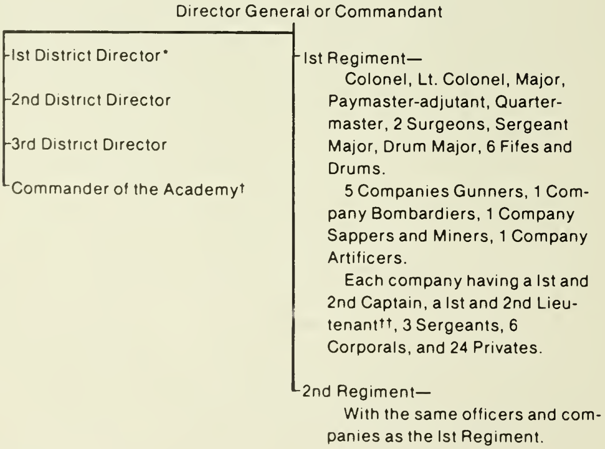
Sorrel is the last post that is to be met on the river it is not fortify'd; the British have at that place barracks for 1500 men and verry Considerable magazins.

—**Washington Papers, roll 93.**

By fall 1783 the full Congress at last seemed to be moving slowly toward consideration of the peace establishment question. Duportail wanted to go home, so Hamilton's committee requested a second, more detailed report from him on the engineering department. The result—forwarded to Washington on September 30—was a strong position paper, the only surviving personal record of Duportail's thoughts on a peace establishment.

The Chief Engineer began emphatically with a call to unite the artillery and engineering departments. Among the reasons he cited were the close relationship of the two in training and practice; great monetary savings; and the elimination of existing disputes over authority. As Gouvion had done earlier, Duportail noted that the French had tried unsuccessfully to unite their artillery and engineers. But, Duportail contended, the union could be achieved more easily in America, "where there is not yet private Interests or *passions* of the Corps to combat."

PLAN FOR A CORPS OF ENGINEERS AND ARTILLERISTS
Presented by Louis Duportail
September 1783



Director General or Commandant

- Ist District Director[*]
- 2nd District Director
- 3rd District Director
- Commander of the Academy[†]

- Ist Regiment—
  Colonel, Lt. Colonel, Major, Paymaster-adjutant, Quartermaster, 2 Surgeons, Sergeant Major, Drum Major, 6 Fifes and Drums.
  5 Companies Gunners, 1 Company Bombardiers, 1 Company Sappers and Miners, 1 Company Artificers.
  Each company having a Ist and 2nd Captain, a Ist and 2nd Lieutenant[††], 3 Sergeants, 6 Corporals, and 24 Privates.
- 2nd Regiment—
  With the same officers and companies as the Ist Regiment.

[*] A Brigadier General or Colonel
[†] A field officer assisted by a captain
[††] Four officers because of the need to detach officers without troops

PLAN FOR A CORPS OF ENGINEERS. *This chart outlines the structure of the peacetime engineering establishment proposed by Chief Engineer Duportail in September 1783.*

To man the peacetime engineering department Duportail wanted two regiments of eight companies each, with one company in each regiment to be a company of sappers and miners. He further proposed a tripartite division of the frontier, with a brigadier general or colonel of engineers as director of each division. The directors' duties included reconnaissance and the planning and erection of defensive works. He placed the district directors outside the regimental command structure and responsible directly to the director general or commandant of engineers. His argument was effective: the directors "Shall have enough to do, without clogging them with the particular Command and Care of a Regiment." To reinforce the fragile union among the states, Duportail favored a single commandant at the head of the engineer corps.

In the conclusion of his report, Duportail again joined the chorus favoring a military academy, which he regarded as "the Nursery of the Corps." The retiring Chief Engineer outlined the academy's structure and proposed leaving vacant the position of second lieutenant within each company of the engineering department's two regiments. The academy's first students would then fill the vacancies, and "Men of Theory and Knowledge" would be more quickly put into service.

The full Congress ignored Duportail's final proposal as it had every other peace establishment proposal.

7. DUPORTAIL URGES UNITING THE ARTILLERY AND THE ENGINEERS

Louis Duportail's recommendations for the engineering department of the army.

September [30], 1783

. . . What I think best for the united States to do . . . is to unite the Department of the Artillery with that of the Engineers So that after the Union every Officer Should be without any Distinction an Artillery Officer and an Engineer. There are many Reasons for the Operation which I propose; The following are the principal ones.

1st. The preliminary Knowledge necessary for an Artillery Officer or an Engineer, as the different Branches of Mathematics, the natural philosophy, etc., are the Same.

2ndly. The very great Relation between the professions themselves. The most important use of Cannon, that one which requires most Skill and Knowledge of the Art is for the Defence of fortified Places or the Attack of them. When an Engineer combines the different lines and Angles of a fortification between themselves and the Surrounding Ground to make that fortification of the most advantageous Defense; when to the Contrary he frames the Plan of the Attack of it, and lays out his Trenches and other Works, he has principally in View to prepare the use of the Artillery; facilitate its Effects and make them as great as possible. So he must be personally acquainted with the Nature of that Arm and have really on that Point all the Knowledge of the Artillery Officer. It is true the Thing is not reciprocal and that the Artillery Officer when he is not Engineer at the Same time and is confined to the Execution of his Cannon does not want to have the Knowledge of the Engineer; But why not make him acquire it Since he has already all the Preliminary Knowledge and the practise of the Artillery; and So he wants only to add the Study of the Art of fortification. Do we not See clearly that to do otherwise is to make two Professions of what ought to be the Object of one only.

3rdly. The great Economy which results from that Union. Wherever there is any fortification there is an Engineer to have the Charge of it, and there is an Artillery Officer for the Artillery. But very often each of those Officers has not a Sufficient Employment in Departmment and if the Departments were united one Officer could do the Duty of the two with the greatest Ease. I think one third of Officers might be Spared upon the whole without the least inconveniency for the Service.

4thly. That great Relation which we said to take Place between the two Professions of the Artillery Office and the Engineers is the Cause of frequent Disputes and Dissentions amongst them, because the line of Separation cannot be drawn exactly, principally for the most delicate Circumstances in War, and the more Knowledge and Talents each Corps possesses, the more Difficulties arise between the individuals, because they have more pretensions. So that reciprocal Envy and Enmity make the very qualities which Should be conducive to the Good of the Service turn against it.

For those Reasons and many less important the Departments of the Artillery and of the Engineers are united in European States; and in those where they are not Plans for uniting them are proposed every Day. In france that Union has been executed once and if it did not last it was because the time was not proper (in the middle of the war), and the Operation was formed upon a bad Scheme. Besides the private Interests of many Individuals principally of the first Officers were much hurted by it. Add to this that, as those Corps, in France exist a long while ago, each of them has acquired a particular *Spirit* which makes it very averse to Such Union. However, every Officer of Experience almost, is persuaded of the Advantage of it, and that it will take Place one Day or another. But here where there is not yet private Interests or *passions* of the Corps to combat, the Congress must avail themselves of a happy Circumstance which may never return to make at once their Establishment upon the Plan that Experience Show to the old Peoples of Europe to be the best, although they cannot always follow their Notions.

Establishment of the Corps of Artillery and the Engineers

I suppose here, according to the letter which his Excellency General Washington has honored me with, the present Establishment must be calculated only for the Want of the Frontiers against the British for if the united States intended to have fortified Harbours, what I am going to propose Should be insufficient.

I propose two Regiments each to be composed of five Companies of Gunners, one of Bombardiers, one of Sappers and Miners, one of Artificers, each Company in time of peace Shall be composed of 3 Sergeants, 6 Corporals, 24 privates, commanded by a first Capt. a second Capt. one first Lt. and one Second Lieutenant. (In time of war the number of privates may be doubled.)

The Regiment Shall be commanded by one Colonel, one Lt. Col. one Major, adding to this, one pay master adjutant, one Quarter Master two Surgeons, one Sergent Major, the Drum major, 6 Drums and fifes, which would make the whole of the Regiment altogether of 327 Men and the two Regiments of 654.

I propose four Officers in each Company because it is necessary to have Some to detach without Troops to different Places for Erection or Care of Fortifications Sunderies, etc. Thus one of the Captains or Lieutenants, may be detached that makes 16 Officers for the two Regiments, one of the field Officers, the Lt. Col. or the Major may be detached also, so in all there will be eighteen which will be sufficient in this Moment.

I propose to divide the whole extent of the frontiers in three Parts at the Head of which there Should be an Officer of the Rank of Brigadier or Colonel to have the Direction of all what concerns the Artillery or the fortifications erected or to be erected and generally of all the Establishments relative to that Department.

Above all there must be a Commandant, Director General of the Artillery and the fortifications of the united States. To the Director General, the three Directors of the Districts mentioned Shall be accountable for every thing, as the Colonels of the Regiments and every Person employed in that Department.

Through him Shall the Orders of Congress or of the Board of War be transmitted to the Corps. Such an Office appears to me absolutely necessary, to have that important Branch of the Administration governed upon the Same plan and constant Principles. Let us remember that a great many Things tend to break the Union between the american States, all the continental Establishments ought to be calculated to reinforce that Union. Thus, if in this Instance, there were, at the Head of the Department of the Artillery and fortifications many Officers independent one from another, great inconveniences might result from it. These Officers would differ in Opinion and Soon be Jealous and enemys of one another; Some might acquire more influence with Congress than others. So in the Establishment of fortifications, in the Distribution of the Means of Defense, each State might be treated, not according to what its Situation, its importance requires, but according to the Credit of the Officer who has the Direction of that Department.

Some Persons will perhaps imagine that the three Directors of Districts proposed are not necessary, that, for the Sake of Economy, the Colonels and the Lt. Col. of the Regiments may be charged with the functions attributed to those Directors. But if they observe, those functions Shall be to make under the Direction of the Director General, an exact Reconnoitre of all the frontier, to Search for the most proper Places for the forts and for all the Establishments relative to War, after that to plan those Establishments, preside over their Erection. They will confess probably, that the Directors of the Districts Shall have enough to do, without clogging them with the particular Command and Care of a Regiment, which they could never attend to. But, as we have mentioned, a field Officer of each Regiment Shall be detached with the directors of the [District?] to assist them and have under them the Command of the Captains and Subalterns employed in the Busyness above indicates.

I do not think it necessary here to expatiate myself upon Talents and Knowledge which the Duty if attributed to the Directors of the Districts requires of them as well as of the Director General. I take the Liberty to refer on that Head to the Memorial, wherein I endeavored to Sketch what is to be done. A Vauban (. . . the greatest engineer France and Europe had . . .) should be necessary in this Moment to the united States and nobody unless he thinks himself as able a Man as that famous Marshall, can undertake, without the greatest Diffidence, that difficult Work. And he who would undertake it, without any fear, proves that he has not the least idea of it.

Academy

The necessity of an Academy, to be the Nursery of the Corps, is too obvious to be insisted upon. The Academy must be commanded (under the Director General) by a field Officer, assisted by a Captain. It requires a Master of Mathematics and natural Philosophy, one of Chymistry, and one of drawing; as for Military Matters, it belongs to the Officers of the Head of the Academy to give those Kind of Instructions. This is not the Place of enlarging upon this Subject. The Student ought to Spend three Years at least at the Academy.

According to the total number of Officers of the Corps, ten or twelve Students Should be Sufficient to keep the Corps compleat; But as it is very advantageous to introduce in it, the Soonest possible, Men of Theory and Knowledge, I will propose here to leave in each Company the place of Second Lieutenant vacant, to fill those Vacancies with the first Students which will receive their instruction at the Academy. So the Number of Students in this Moment, might be of twenty, and I do not doubt that it Shall remain Such afterwards, because if the Union of the States [is?] durable the Establishment proposed here Shall be found certainly too Inconsiderable, and if I propose it So, it is only to fall in with the present Circumstances and Dispositions.

. . . It is not improper perhaps to observe here that according to the calculations i made the total establishment—such as i propose it—including the academy, the Rations and Cloathing will not Cost much more than two hundred thousand Dollars. Only i lessen a little the pay of the soldiers which is Really too high.

—Papers of the Continental Congress, roll 45.

Still hoping for a peacetime army and particularly concerned with getting adequately trained artillerists and engineers, Washington pressed Duportail to convince at least a few French officers to remain in America. The Chief Engineer himself preferred not to stay,[15] but he felt sure other men might want to. However, they would require that the United States give them "an honorable, solid employment" and "show themselves to be a great respectable empire, or at least take proper measures for becoming so." As matters stood, Duportail maintained, anyone choosing to stay would clearly be making a blind choice.[16] Congress's continued inaction tied Washington's hands. By the end of the year Duportail and Gouvion had returned to France.

In late 1784 Maj. Pierre Charles L'Enfant, a Revolutionary War engineer officer who would later achieve great fame as the designer of the nation's capital, made another vain appeal for a peacetime engineer corps. Earlier L'Enfant had been led to believe that he would head the postwar engineering department, but now there was no department to command. Worse still, he had already forfeited the chance for an engineering appointment in France.

In his detailed, well-reasoned memorial, L'Enfant did not advocate a European-style army for the United States, but he recognized the need for a general system of defense planned and maintained by army engineers. His preference for continental rather than state engineers and for a centralized system of fortifications was clear. He feared the states were insufficiently aware of the potential threats to their security. "It is neither the number nor extensiveness of forts that Secure a country," L'Enfant insisted, "but their well combined Situation."

To a greater degree than anyone else, L'Enfant elaborated the qualifications of engineers and their training, organization, and duties. Although he attested that "real Knowledge of Several Sciences" was prerequisite to successful performance, L'Enfant curiously did not specifically recommend a military academy. The engineer required qualities that could not be obtained through study—a "cool and active disposition," pride, and sobriety.

In light of later Corps of Engineers responsibilities, L'Enfant's plan was remarkably prescient. As he specified them, the engineers' duties were to include operation of all fortifications, direction of all military and civil construction, maintenance of public roads and bridges, and general surveys. Each of the three proposed engineer brigades would be assigned to a separate geographical area. States could request assistance through the Chief Engineer. To assure quality construction and maintenance, L'Enfant proposed constant inspections of the corps's work, including an annual inspection of the most important projects by the Chief Engineer.

In L'Enfant's view the Chief Engineer's other duties included personal direction of the construction of key works and preparation of an annual report and an estimate of future expenses. The Chief Engineer also had contracting and financial responsibilities. First, he was to see that no major project "be contracted for privately but advertised to those who will give the most reasonable proposals," then he was to certify accounts and authorize payments.

Considering L'Enfant's later career, one of his arguments for an engineering establishment was especially interesting. The corps, he said, would be excellently equipped to build public buildings—such as a home for Congress—once a permanent capital was decided upon. Like earlier proposals for a peacetime engineering department, L'Enfant's fell upon deaf ears.

8. "A NEUTRAL POWER MUST BE READY FOR WAR"

Pierre L'Enfant's peace establishment plan.

December 15, 1784

. . . Under the flatering expectation of your Indulgence I will endeavour to hold up to your consideration some Reflections on the present State of America and Suggest such measures as are most immediately necessary to be taken as well to Secure the benefits of the peace which the United States so happily enjoy as to promote their internal tranquility during the troubles of any new Contest that may arise. . . . A neutral power it will be said receives the benefits of an universal trade, has his possessions respected as well as his Colours by all powers at war; this may be said of a powerful Nation but this America is not to expect, a neutral power must be ready for war and his trade depends on the means of protecting and making his Colours respected; America neutral without Navy without troops or fortified harbours could have nothing but calamity to expect, her coast her Sea towns exposed to the insult of the first advanturer would often becom the prey of the fortunate one who from a premeditated intention or forced by necessity entering in a defenceless harbour Soon followed by his adversary would without other Regard than that of his own Safety change in an instant the pleasant Seat of peace into a theatre of Sanguine Exertion, then when her Coasts were wasted and her towns plundered Should She call for protection or attempt to obtain Redress not only would it prove useless but Even any measures She might take to prevent repetition of Such flagrant Evils will be suspected for th'o not in fact a motive for difference they may become from a Watchful Enemy a means of covering under apparent Excuse some unexpected and offensive Undertaking. As a power taking an active party alliance Would be entered into, fleets to protect the Coast may be depended upon trade will flourish, proper measures being taken to guard the frontier against sudden invasion no inland war being to be feared, privateering may be encouraged. Riches Honour and plenty will ensue.

War or peace is the option and no dependance may be made in either choice, such are the Evils and advantages which America has to considere . . . . Opposition to the levy of permanent troops and neglect in fortifying and garrisoning proper posts must not only become prejudicial to tranquility but ruinous and destructive to liberty and independence: power to Resent [and] ability to protect are the only means to secure National faith. These are the points which America has to attend to and upon which her credit as a Nation is to depend. Proper forts arsenals Magazines and a well disciplined body of troops are of most important and urgent Necessity. No Nation whatsoever having right to expect to be free from those calamities to which ambition and jealousy constantly expose them . . . . Considering America with regard to the respective States as a Valuable tract of land held in common by a Society whose general interests do not depend on the security of its internal division but entirely on that of the whole of its circumferences whose expences of fencing or walling are to be at the general charge and consequently necessary to be calculated on a general principle; from that comparisons the respective States being to consider themselves interested in securing not only that portion of the frontier which makes a part of thier possession, but even that which has the same Reciprocity with the other States of the Confederation, it being evident that the neglect of one of them may occasion the Ruin of the other; care and attention in guarding them cannot be depended upon but by trusting the security of the frontier in general to the supreme power representative of the Confederate States as to the one more directly interested in preserving the whole: what I Said of the frontier I not only understood the inland Boundary but I speak of all the Sea Coast and meant every harbour and Entrance whose present situation cannot but be alarming not only with respect to the Honour credit and tranquility of each of the States in particular but to that of the United States in general, it being incontestible that any insult offered on that side would be of more capital consequence; . . . a general plan of defence is to be adopted . . . to be under the direction of an Engineer in chief trusted to the care of officers of continental description who Should have the care and inspection of all the fortifications, magazin[es], etc. . . . already erected or to be built. This mode will not only prevent inconveniency but save the Expenses which would arise to the different States from having Engineers of thier own and yet the States individually receive the same benefit the Engineers of continental establishment being divided in different brigades or departments would have the directions of Every work which the States Should considere as necessary to add to thier strength and tho those continental officers Should be under the laws and discipline of the Continental troops they Should be bound to follow Such directions which agreeable the general interests Should be given to them by the Executive power of the State where they shall make thier residence and Should be made responsible for the Safety of the posts under their inspection; this mode of having Every object of the same description under a single chief and same department will not only be a real means of avoiding unnecessary expences but will enable Gouvernment to receive better information and form a more just idea of the advantages or defects of Such and Such places which may happen to be injured. . . .

. . . The danger of the defenceless State of the frontier being evident, and considering that it is indispensable to have the Situation number and extensiveness of forts combined to enable a proper calculation of the number of troops which are to garrison them. Engineers whose duty is to be independent of that of other Regiments ought from circumstances of more immediate necessity to be appointed previously to the levy of any body of troops and supposing that obstacles will hinder the appointment of a Sufficient number, a chief with aides may be provisionally appointed and proper assistance and directions given to him to reconnoitre the frontier which will enable him to project proper plans, from whose view may be obtained a more just idea of the differents importance of the Several points where fortifications may be necessary for the better security of the indian trade, of the different harbors as well as protection to the Emigrants who can only receive Encouragement to settle in the desert frontier. But from a particular attention in protecting them. These plans of the position and nature of the forts proposed Being examined Should as already mentioned when adopted remain in the hands of the Continental power and commited to the care of the Engineer in chief . . . .

. . . Jealous to give particular proofs of the attachment, I bear to the welfa[re] and happiness of America I Shall With eagerness continue longer Spending my time in her service if persuaded by the Evidence and considerations of the advantages of the proposed corps of Engineers your Honorable Body will favour me with further directions concerning its formation which I look up [on] as the only one from whose assistance and Knowledge can be obtained the requisite points for which fortifications are inten[ded], parting from the principle or maxim that it is neither the number nor extensiveness of forts that Secure a country but their well combined Situation calculated with the means of procuring Supplys and the number of men trusted with their defences. . . .

Observations upon the qualifications requisite in an Engineer and without which they could not be Considered as such.

Previous to enter into the particular concerning the duty of Engineers and to propose any Schemes for the better formation of a body upon whose attention the Safety and quiet of Every nation generally depend, it is necessary to reflect upon the qualification which it is requisite that they Should be possessed of, the good performance of their duty being to depend upon their real Knowledge of Several Sciences which are necessary to be considered.

Arthmetic—Is necessary for enabling them to make an exact mensuration of all work together with a proper Estimate of Expences, etc.

Geometry—Without a perfect Knowledge of which no dependance can be made upon any Survey nor upon any draught of any work or building whatsoever.

Mechanism [*Mechanics*]—Which is necessary to forme a Sound idea and establish any Confidence in the Strength or Composition of any machine whatsoever, etc.

Architecture—Whose Knowledge is essential in Every building undertaking, etc.

Hydraulics—Which relate to water works and give the means of raising or changing the course of water, etc.

Drawing—Without the assistance of which no plans no Schemes whatsoever can be well explain written explanation being insufficient . . . to give a just idea of the local and particular Situation of any place, work building, etc.

Natural-Philosophy [*Chemistry and Physics*]—Natural philosophy being necessary to judge of the nature of the Several materials which are used in building as that of the quality of the Elements that of the water and of the air being necessary to judge of their wholsome qualifications with a vi[ew] to avoid making establishment in any places which might be injurio[us].

Many persons who to not reflects upon the Relations which all these Sciences have to one another Will object that a Knowledge of thems all cannot be expected in the same person but as the Knowledge of one facilitates the acquiring of another. Men of intelligence will soon obtain a sufficient idea of their general Rules and principles. For besides those qualifications which are to be acquired by Study an Engineer Should be possessed of goods natural parts, of a cool and active disposition, Pride and sober: he must be fit for performing his duty in war with as much and Even more attention than in peace Considering that in war a man possessed as all the acquired Knowledge possible will be but little able to reduce it into practice without this quiet and active disposition, etc.

Duty of Engineers and Rules to Which they must be Subject, etc.

Every Engineer Shall be a Continental and a body shall be formed subject to the laws and discipline of the armies of the united States but no dependant of any particular corps or Regiments, being to work however with the other officers according to the Date and terms of their commissions and susceptible of command in Every places where they were senior to the other officers.

The duty of the said Corps shall be to attend to and have the direction of all the fortified places that of all military and civil building, the maintenance of the Roads bridges and Every Kind of work at the public charge, surveys of the several places Shall be by them made and properly drawn with a view to make out an atlas of the whole Continent from which the Supreme power may be able to obtain a more just idea of its situation and forme a distinct opinion upon its advantages and defects to these plans Shall be added proper Notes and Remarks with Schemes for taking advantage of good positions or of preventing the defects of some unavoidable inconveniency.

These officers shall be divided into three brigades each of which shall have under their care a proportioned number of the severals States.

The several States individually shall have a right to call for their assistance upon which they are to depend provided that a direct application be made to the Engineer in chief whose attention will be necessary to prevent an abuse of the said liberty which might become injurious to the progress of Continental undertakings.

The officers of the several Brigades or departments shall follow the directions given them by the Senior Engineers at the head of the respective brigades and Shall be accountable to them for the performance of their duty. They shall receive no orders from any other persons nor shall undertake any work without their Knowledge and consent, and the head of the different departements shall give them no orders without the authority of the Engineer in chief who is to be under the Controul of the Supreme power. They Shall be answerable for the goodness of the work under thier direction as well as for their maintenance and Shall inspect once in three months. Every objects under their care being to be assisted by the officers in the several places or the other persons to whom Should be committed any magazines Aarsenals. Of the State of which they Shall send an account to the Engineer in chief with a proper return of the damage which may have happened with Notes upon the differents nature of the work and of the materials considered necessary for Repairs with an Estimate of the time and number of men it will require. No work to be undertaken previous to its urgency Being acknowledged by the Secretary at War or other perso[ns] in that department. With the Single exception of a Capital injury in a place of importance requiring immediate repair in Which case only the remedy Shall be instantly applied, giving notice of the urgency of the Case and having it certified by the officer commanding in the place.

The Engineer in chief will have the direction and inspection of the whole and Shall in the course of Every year visit the more important places he Shall Keept up the most exact And Severe disipline amongst his officers and be made answerable for all matters committed to their care, he Shall attend in person to the execution of the more capital works and at the end of Every year shall give an account of the progress of those which may have been undertaken and a general State of the whole with a return of the expences they Should have occassioned and an Estimate of those which will result from the undertaking of the works proposed for the ensuing Season, he may project and draw Every plan which he shall judge proper and submit them to the examination of the Supreme power—as to those of other persons by him appointed, none but his own plans or those he Shall have approved and signed Shall be susceptible of being executed: all persons who Shall draw any maps plans of their own or as copies Shall add their names with mention of the case: none Shall be presented to the Supreme power without having been communicated to the Engineer in chief who Shall certify the Same. An Exact account is to be Kept by him of all the plans maps, etc., which Shall be deposited in the War office and for which receipts are to be given to him as well as for Every Memorial. Return account, etc., he Shall adjust at the end of Every year the quarterly accounts which he Shall have received from the heads of the severals departments. Shall compare them with those of provisions and furniture and according to their exactness will giver Certificates.

He Shall Keept an exact account of all tools and defferent sorts of the materials which Shall be in Every Store at the openning of every Season for the year preceeding, from the account of the several works which should have been done he Shall judge of the proper employment of those which Should haven been taken out and if necessary make proper application to have them replaced before the opening of the ensuing Season he Shall pay attention to the furniture that it be of a good quality—and observe that none of a Capital nature Shall be contracted for privately but advertised to those who will give the most reasonable proposals and such as can be had in the vicinity of the place where wanted Shall have the preference. By th[is] means useless expenses will be avoided resulting from a double employement of men and carriage. He Shall certify all Settle-men[ts] of accounts and no money Shall be given upon any return not Signed by him.

All Labourers and journeymen employed in his departaments Shall be Subject to the laws and discipline of the armies at the united States for the time they Shall remain under their directions. And in order to avoid expences and prevent the inconveniency resulting from hired labourers as practised in the civil line a number of workmen of all descriptions Should be inlisted as Soldiers and formed into three campagnies equally Shared among the Several departments and Should remain under the immediate command of the respective officers of the Severals Brigades. Which when reunited the three Should form a Battalion headed by the chief Engineer. These men Shall be Cloathed armed and Exercised like other foot regiments of the united States. Their pay being only to differ. The duty they Shall perform the hardship they are to undergo requiring a higher one whose amount however not being to be compared to the Expence of Keeping hired men will prove beneficial not only considering the money it will Save but the good which must result from the better dependance to be placed upon the Skill of men constantly employed in the same ligne of duty commanded by officers who from a habit of living with them will have repeated oportunities of juging of their ingenuity and consequently can trust on their attendance. The officers pay Shall be regulated with the Same regard to the duty they are to perform which duty will require that they have all the Conveniencies of life considering also the frequent journeys they must make and the expence of Keeping horses it being necessary that they be always ready for marching and not forced when called to duty to wait for Supplies of money or of other matter of which they Should happen to be in need all delay being to be avoided in the execution of thier orders and performance of their duty to which, they are to attend without any pretence to particular rewards which they are to expect only when employed for the benefit of a particular state in which case the Said State Shall give additional pay to the men and officers according to the time they have served and the nature of the duty performed.

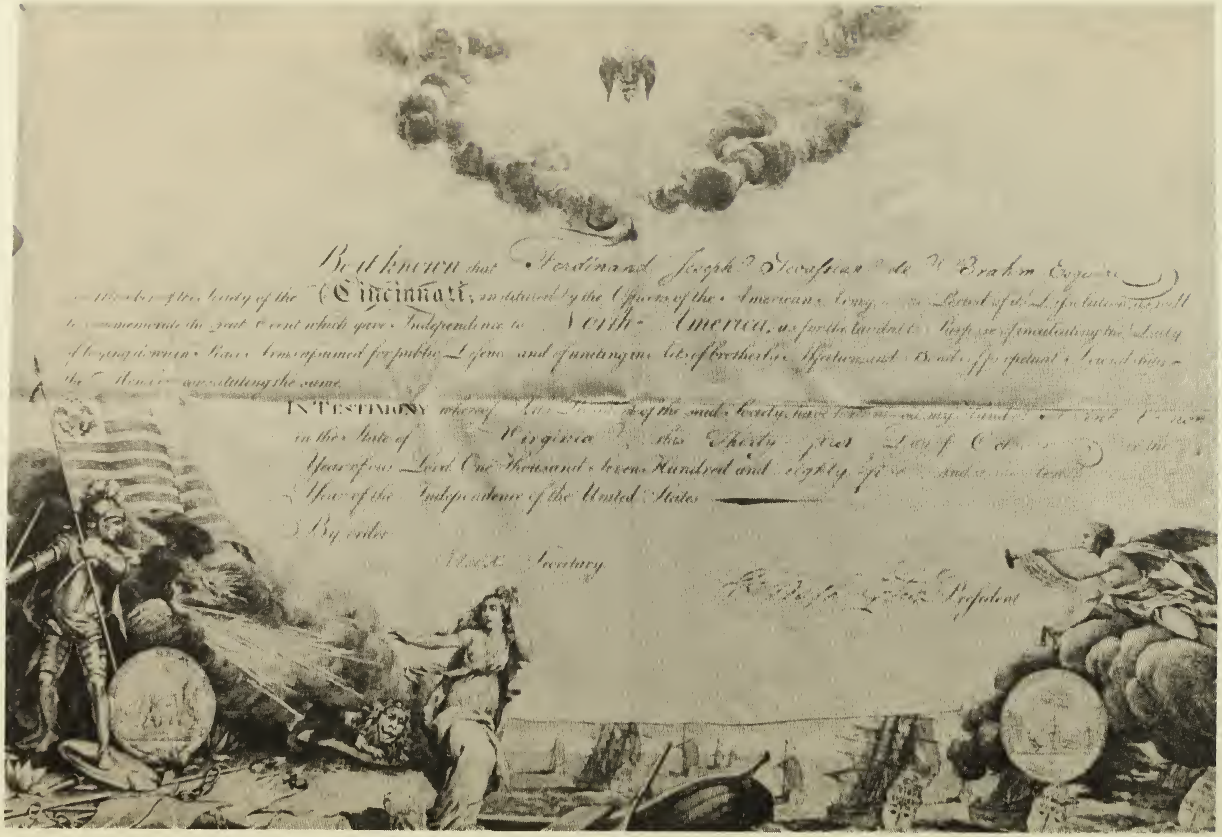
As to the denomination of the several officers with respect to their Rank they Shall be commissioned as the officer of the other Regiments holding differents rank, with that attention that considering the misunderstanding which arises from discontent and and is the result of the Reluctance with which officers th'o jealous of well performing their duty attend to the opinion of men whom they considere as inferior in rank. It is necessary that the heads of each Brigades or department be field officer of a denomination under that of the Engineer In chief who Should be a general one, which title it is the more proper he Should be possessed of to enable him to perform the different lines of his duty, and make him considered in all the places or posts he is to inspect and for whose safety being made answerable it is consequently indispensible that his opinion be predominant over that of other officers who th'o trusted with the defence of such and such places are not to be supposed as possessed of the Knowledge and qualifications requisit in an Engineer whose Superiority of Rank cannot be in the least injurious to other officers in the Army the nature of their duty being entirely different and necessary to be independant of others. . . .

Formation of the Corps of Engineers as proposed and considered in the Scheme for new modeling it:

Number of Officers	Their Rank	The Brigades they are to be attached to
1	Brigadier general	Having the center and being Engineer in chief
1	Lt Colonel	Having the right
1	Major	Having the left
3	Captains	One in each
3	Lieutenants	One in each
1	Adjutant	. . . aid and Secretary to the Engineer in chief
10		

Formation of a Battalion of Workmen under the denomination of Sappers and miners:

100 men	1 Company	of the center commanded by a Captain and Lieutena[nt] belonging to that brigade
100	1 Company	Of the right commanded by a Capt and Lt. belonging to that brigade
100	1 Company	of the left commanded by a capt and Lt. of that Brigade
300 men	3 Companies forming a Battalion which when collected Shall be commanded by the Engineer in chi[ef] as Colonel the Lt Colonel Major and its officers.	



Be it known that Ferdinand Joseph Sebastian de Brahm Esquire is a Member of the Society of the Cincinnati, instituted by the Officers of the American Army at the Period of its Dissolution, as well to commemorate the great Event which gave Independence to North America, as for the laudable Purpose of inculcating the Duty of laying down in Peace Arms assumed for public Defence, and of uniting in Acts of brotherly Affection and Bonds of perpetual Friendship the Members constituting the same.

IN TESTIMONY whereof I the President of the said Society, have hereunto set my Hand at Mount Vernon in the State of Virginia this Thirty first Day of October in the Year of our Lord One Thousand seven Hundred and eighty five and in the tenth Year of the Independence of the United States

By order

H Knox Secretary

G Washington President

Division of each Company. Each Company—2 divisions and each division 2 platoons the first division commanded by the Capt. . . . the Second By the Lieutent. Each platoon by a Subaltern ranking as mentioned in the military Establishment.

The Service which is to be Expected from such an Established corps, will prove a mine to Save more than the said third of Expences in any underta[king] what soever. Advantages which will turn to the immediate benefit of the United States by comiting to the Said corps the Execution of all building underta[king] such as those of a Congress, who were Ever the Seat of his permanent residence is to be agreed upon will necessitate to have Erected proper building whose local to Enforce the object of thier destination are to be combinated in Such a maner as to give an idea of the greatnes of the empire, as well as to Engrave in Every mind that Sense of respect due to a place which is the Seat of a Supreme Sonverainty. . . .

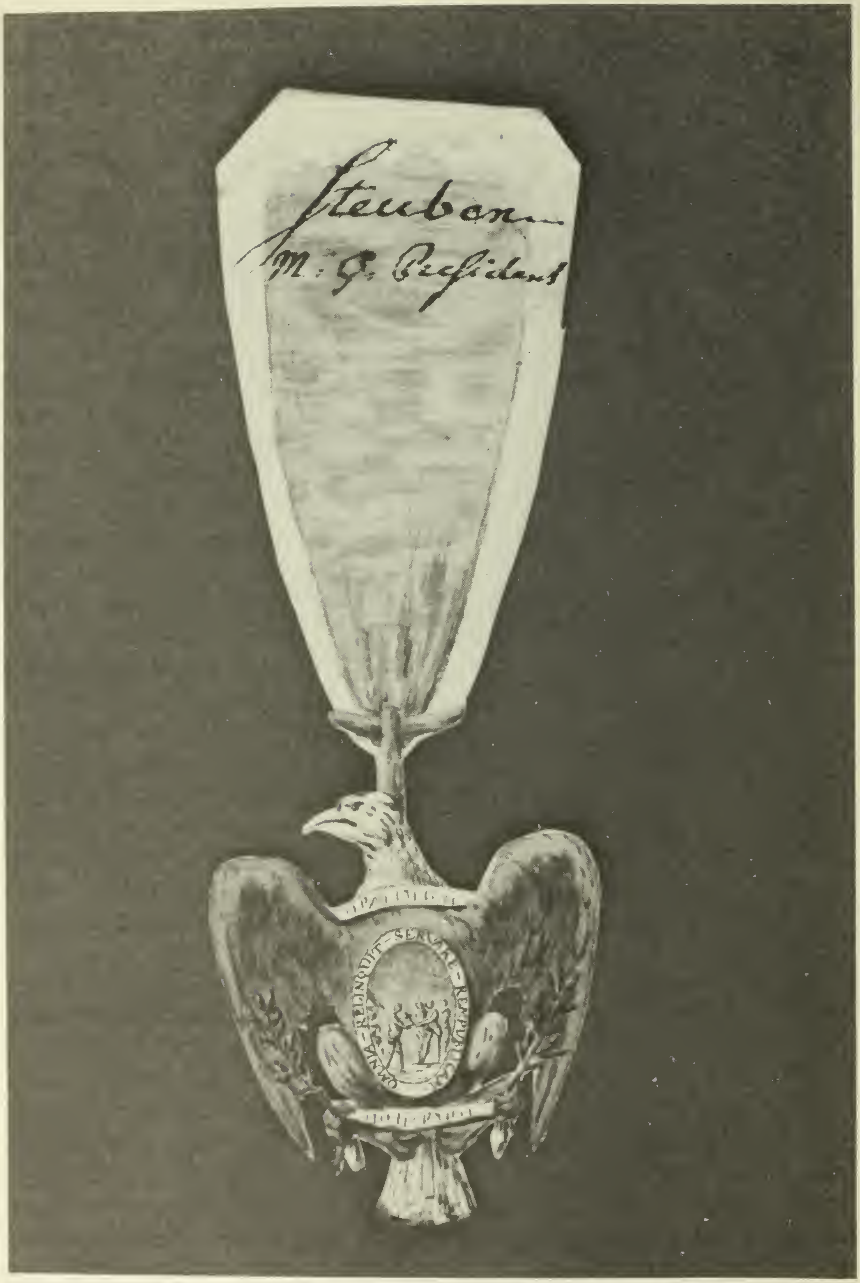
—Papers of the Continental Congress, roll 98.

Although Congress shelved the peace establishment proposals in 1783–84, the ideas they contained remained alive. Peace establishment advocates merely retreated to the background and waited until they were in a better position to gain acceptance of their ideas. Strong opposition continued, forcing supporters to move cautiously. Thus over the next eighteen years, a peacetime American Army took shape piecemeal.

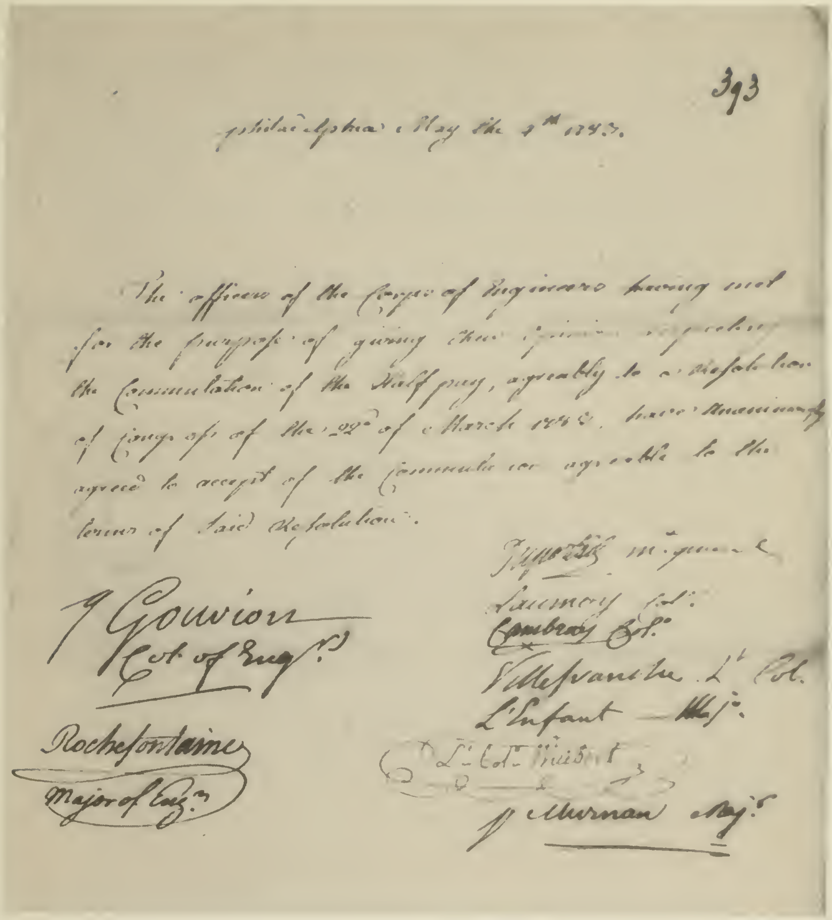
Despite their valuable wartime contributions, by the end of 1783 the Corps of Engineers and its companies of sappers and miners were allowed to muster out of service along with all but Col. Henry Jackson's Continental Regiment and a unit of artillery stationed at West Point. On 2 June 1784 Congress abolished Jackson's regiment, retaining only the unit of artillery to guard West Point, Fort Pitt, and a few magazines. However, the next day Congress voted a new force of 700 men that became the 1st American Regiment under the command of Lt. Col. Josiah Harmar, assisted by Capt. John Doughty, commander of the surviving artillery unit. Over the next several years the 1st American Regiment built several new forts on the western frontier. Trained engineers were not involved. The new forts offered vital protection for the settlers, Indian agents, and land surveyors who poured into the Ohio region.

SOCIETY OF THE CINCINNATI DIPLOMA. *In May 1783, to perpetuate the memory of the Revolution and maintain lasting friendships, a group of Continental Army officers formed the Society of the Cincinnati. Pierre L'Enfant of the Corps of Engineers designed the society's diploma. The one shown here belonged to Ferdinand de Brahm.*

Private Collection of Dr. Robert A. Stein



BADGE OF THE SOCIETY. *L'Enfant designed this badge for the Society of the Cincinnati, which many of the engineer officers joined. French veterans established a branch of the organization in Paris.*
Society of the Cincinnati, Washington, D.C.



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philadelphia May the [illegible]th 1783.

The officers of the Corps of Engineers having met for the purpose of giving their opinion respecting the Commutation of the half pay, agreeably to a Resolution of Congress of the 22d of March 1783, have unanimously agreed to accept of the Commutation agreeable to the terms of said Resolution.

J Gouvion
Col. of Engrs

Rochefontaine
Major of Engrs

Laumoy Col.
Cambray Col.
Villefranche Lt Col.
L'Enfant Majr.
J Murnan Majr

ARMY PENSION AGREEMENT. *Responding to demands from the Army, Congress in March 1783 proposed giving officers full pay for five years in interest-bearing government securities rather than a pension of half-pay for life as originally promised in 1780. By signing this document in May 1783 a majority of the engineer officers, all foreigners, accepted Congress's plan.*

Record Group 360, National Archives

Although Congress balked at the idea of a postwar establishment with an engineering department, it did see the need for a geographer and surveyors. Thus in 1785 Thomas Hutchins became geographer general and immediately undertook his biggest assignment—surveying "Seven Ranges" of townships in the Northwest Territory as provided by the Land Ordnance Act of 1785. For two years Harmar's troops offered Hutchins and his surveyors much-needed protection from Indians.

When the new government under the Constitution was launched in 1789, Secretary of War Henry Knox recommended "a small corps of well-disciplined and well-informed artillerists and engineers." Nevertheless, no engineers served the Army until March 1794. At that time Congress authorized President Washington to appoint temporary engineers to direct the fortification of key harbors. Among those named were L'Enfant and Maj. Stephen Rochefontaine, another veteran of the Revolutionary War Corps of Engineers.

The following May, heeding the much earlier advice of Duportail and others, Congress established a single Corps of Artillerists and Engineers, consisting of one regiment. Rochefontaine assumed command of the new Corps. At the same time a school to train Army officers was set up at West Point.

As war with France threatened in 1798, Congress added a second regiment to the Corps of Artillerists and Engineers, with John Doughty, now a lieutenant colonel, as commander. In 1802 Congress again reduced the military establishment and designated separate regiments of artillerists and engineers. The union which so many Revolutionary War engineers had supported was short-lived indeed. Yet even with the reduced peacetime force, a regiment of engineers was retained and a military academy permanently established at West Point.

Notes

Notes to Chapter I

1. Washington to the President of Congress, 10 July 1775, in John C. Fitzpatrick, ed., *The Writings of George Washington From the Original Manuscript Sources, 1745–1799*, 3:325.
2. Rowena Buell, comp., *The Memoirs of Rufus Putnam and Certain Official Papers and Correspondence*, pp. 54–55.
3. Washington to the President of Congress, 4 August 1775, in Fitzpatrick, *Writings of Washington*, 3:391.
4. Washington to the President of Congress, 31 December 1775, in *ibid.*, 4:196.
5. Washington to the Committee of Safety of Pennsylvania, 17 June 1776, in *ibid.*, 5:154; Washington to Nicholas Cooke, 28 April 1776, in *ibid.*, 4:528.
6. Washington to the Committee of Safety of Pennsylvania, 17 June 1776, in *ibid.*, 5:154. The new volunteers were Gilles Jean Marie Roland de Barazer, the Chevalier de Kermorvan; Antoine Felix Wuibert de Mézières; Christopher Pelissier; and a Monsieur St. Martin.
7. Carroll to the Maryland Council of Safety, 27 July 1776, in Peter Force, ed., *American Archives*, 5th ser., 1:614.
8. Resolution of Congress, 2 December 1775, in Worthington C. Ford, ed., *Journals of the Continental Congress*, 3:400–401.
9. For more detail see Frederick B. Artz, *The Development of Technical Education in France, 1500–1850*, pp. 98–99.
10. Henry Guerlac, "Vauban: The Impact of Science on War," pp. 39–41. Unfortunately, after Vauban's death in 1707, his supporters progressively corrupted his thought on defenses by emphasizing geometric rather than tactical considerations, thereby losing touch with Vauban's characteristic flexibility. As a result, when engineer officers evoked the memory of Vauban, they failed to comprehend the real significance of his work. For a definition of enceinte and other engineering terms used in this work, see the glossary.
11. Variable spellings of Coudray's name have been found. Mark Mayo Boatner cites French authority André Lasseray's use of "de Coudray" (*Encyclopedia of the American Revolution*, p. 1118). However, most contemporary documents used "du Coudray" and that form has been adopted here. In any case, all seem to agree in referring to him more commonly as "Coudray."

After 1715 French military theorists debated the virtues of the *ordre profond* (organization in depth) and the *ordre mince* (thin lines), as well as the role of artillery. Coudray gained his reputation as a theorist with his *L'artillerie nouvelle* and with *L'ordre profond et l'ordre mince considerées par rapport aux effets de l'artillerie*. Coudray supported Jean Baptiste Vaquette de Gribeauval's new system of artillery which placed emphasis on mobility. Coudray's arguments on the overall effectiveness of artillery were convincing. See Robert S. Quimby, *Background of Napoleonic Warfare*, pp. 228; 232, n. 29; 359; 360, n. 32.

12. With the approval of French authorities, Pierre Augustin Caron de Beaumarchais provided clandestine aid to America through his firm, Roderigue Hortalez & Cie.
13. Unfortunately copies of the contracts have not been found.
14. Lee to the President of Congress, 7 May 1777, in [Charles Lee], *Lee Papers*, 2:18.
15. Washington to Richard Henry Lee, 17 May 1777, in Fitzpatrick, *Writings of Washington*, 8:76.
16. *Ibid.*
17. Lovell to Whipple, 3 June and 7 July 1777, in Edmund Cody Burnett, ed., *Letters of Members of the Continental Congress*, 2:394, 403.
18. Lovell to Whipple, 7 July 1777, in *ibid.*, p. 403.
19. Washington to Gates, 29 July 1777, in Elizabeth S. Kite, *Brigadier-General Louis Lebègue Duportail*, p. 30.
20. See "Clermont-Crevecoeur Journal" in Howard C. Rice, Jr., and Anne S. K. Brown, eds. and trans., *The American Campaigns of Rochambeau's Army, 1780, 1781, 1782, 1783*, 1:50. This version of Coudray's death is more plausible than the one more generally provided which contends that Coudray's horse leaped from a ferry. In a gesture of friendship, Congress paid for Coudray's burial.
21. They were François Louis Teissèdre de Fleury; Jean Louis Ambroise de Genton, the Chevalier de Villefranche; and Pierre Charles L'Enfant.
22. They were Louis Antoine Jean Baptiste, the Chevalier de Cambray-Digny; Etienne Nicholas Marie Bechet, Sieur de Rochefontaine; and Jean Bernard Gauthier de Murnans.
23. He was Jacob Schreiber.
24. Washington to the President of Congress, 26 January 1777, in Fitzpatrick, *Writings of Washington*, 7:65.
25. Washington to Philip Livingston, Elbridge Gerry, and George Clymer, 19 July 1777, in *ibid.*, 8:443.
26. Erskine to Philip Schuyler, 7 May 1780, in Albert H. Heusser, *George Washington's Map Maker; A Biography of Robert Erskine*, ed. Hubert G. Schmidt, pp. 208–09. It is difficult to compare the value of the $4 given Erskine with the $5 set value of a guinea gold piece. The difference, as indicated by Erskine's comments, was probably more than $1 per day.
27. Resolution of Congress, 8 March 1782, in Ford, *Journals of Congress*, 22:120, by which an assistant geographer with the same pay was appointed. His pay was $2 and one ration per day.

28. *Ibid.*, 20:476. On July 11 Congress designated both individuals as "Geographers to the United States of America." See also *ibid.*, p. 738.

29. For details on the development of the geographer's department during the Revolution, see Silvio Bedini, *Thinkers and Tinkers: Early American Men of Science*, chapter 11, especially pp. 251–55. This department was the predecessor of the Corps of Topographical Engineers established in 1818.

Notes to Chapter II

1. Rowena Buell, comp., *The Memoirs of Rufus Putnam and Certain Official Papers and Correspondence*, p. 60.

2. Putnam was quoting from *Traité de la sureté et conservation des états, par le moyen des forteresses* (pp. 394–401) written by a Monsieur Maigret, a student of Vauban and an engineer and chevalier of the Royal and Military Order of St. Louis. Maigret's work "became the standard work dealing with the strategic significance of fortifications" and was used as a text at the French engineer school (Henry Guerlac, "Vauban: The Impact of Science on War," p. 46).

3. Washington to the President of Congress, 5 October 1776, in John C. Fitzpatrick, ed., *The Writings of George Washington From the Original Manuscript Sources, 1745–1799*, 6:160.

4. Washington to the Board of War and Ordnance, 29 July 1776, in *ibid.*, 5:348.

5. Washington to the Committee of Congress with the Army, 29 January 1778, in *ibid.*, 10:399.

6. Washington, general orders, 9 June 1778, in *ibid.*, 12:40.

7. Washington to the Board of War, 4 April 1779, in *ibid.*, 14:332–33.

8. Regulations 9, 10, 12, and 13 for the sappers and miners are not reprinted in Fitzpatrick and have not been found elsewhere.

9. Washington to Duportail, 27 July 1779, in *ibid.*, 15:491–92.

10. The reference is to Capt. William McMurray of the sappers and miners.

11. William McMurray, et al. to Washington, 26 April 1780, roll 66, Washington Papers, Library of Congress; James Gilliland to Alexander Hamilton, 28 January 1780, Tench Tilghman Miscellaneous Mss, New-York Historical Society.

12. Washington to the President of Congress, 26 January 1780, in Fitzpatrick, *Writings of Washington*, 17:444.

13. Washington, general orders, 22 July and 3 September 1780, in *ibid.*, 19:224, 497.

14. Records indicate that Martin was a corporal at this point and probably attained the rank of sergeant later.

15. William McMurray et al. to Washington, 26 April 1780, roll 66, Washington Papers.

Notes to Chapter III

1. Richard Frothingham, *History of the Siege of Boston, and of the Battles of Lexington, Concord, and Bunker Hill*, p. 115.
2. Gridley to Congress, 8 July 1786, roll 54, Papers of the Continental Congress, National Archives.
3. Frothingham, *Siege of Boston*, p. 123; Samuel Gray to Mr. Dyer, 12 July 1775, in *ibid.*, "Appendix," p. 394.
4. The precise size of the redoubt is open to question as different accounts place it between 45 and 100 square rods.
5. *Gentleman's Magazine* (London), quoted in Frothingham, *Siege of Boston*, pp. 197–98.
6. *Ibid.*, pp. 198–99.
7. Quoted in *ibid.*, p. 116.
8. See note 4 above.
9. William Heath, *Memoirs of Major-General William Heath*, pp. 15–16.
10. Washington to Jonathan Trumbull, 2 November 1775, in John C. Fitzpatrick, ed., *The Writings of George Washington From the Original Manuscript Sources, 1745–1799*, 4:61.
11. Lee to Robert Morris, 27 July 1775, in [Charles Lee], *Lee Papers*, 1:199.
12. See Christopher Ward, *The War of the Revolution*, 1:111–12.
13. Lee to Rush, 19 September 1775, in *Lee Papers*, 1:206.
14. Quoted in Frothingham, *Siege of Boston*, p. 274.
15. *Essex Gazette*, quoted in *ibid.*, p. 269.
16. Henry Steele Commager and Richard B. Morris, eds., *The Spirit of 'Seventy-Six*, pp. 173–74.
17. Rufus Putnam was referring to John Muller's edition of *L'Ingénieur de Campagne, or The Field Engineer* (1773) by Clairac. A check of this work revealed that only passing reference to chandeliers was made, indicating that Putnam may have incorrectly recalled the title of the book he used.
18. [John Chester], "Extracts from Private Letters of Captain John Chester," p. 127.
19. Rev. William Gordon to Samuel Wilson, 6 April 1776, in Commager and Morris, *The Spirit of 'Seventy-Six*, p. 178.
20. *Ibid.*, p. 174.
21. Heath, *Memoirs*, p. 36.
22. See also Howe to the Earl of Dartmouth, 21 March 1776, in Peter Force, ed., *American Archives*, 4th ser., 5:458–59.
23. Washington to Gridley, 28 April 1776, in Fitzpatrick, *Writings of Washington*, 4:528–29.
24. Gridley was noting the absence of adequate manufactories for shells.
25. Gridley to Heath, 9 March 1778, Heath Papers, Massachusetts Historical Society.
26. [Duportail], "Proposals for Preventing a British Blockade of Boston," 1 September 1778, roll 25, Washington Papers, Library of Congress.

27. Washington to Duportail, 29 September 1778, in Fitzpatrick, *Writings of Washington*, 12:521–22.
28. Heath, *Memoirs*, p. 180.

Notes to Chapter IV

1. At the time Col. Anthony Wayne commanded the 4th Pennsylvania Battalion at Ticonderoga. He assumed command of the garrison the following November.
2. The reference is to Captain Ebenezer Stevens of Knox's Continental Artillery Regiment. Stevens was the senior artillery officer at Ticonderoga and did not become a major until 9 November 1776.
3. Resolution of Congress, 3 September 1776, in Worthington C. Ford, ed., *Journals of the Continental Congress*, 5:732.
4. Charlotte S. J. Epping, ed., "Journal of Du Roi the Elder," p. 153.
5. Brig. Gen. John Sullivan led reinforcements to Canada in the spring of 1776 and assumed command of the retreating American army after the death of Maj. Gen. John Thomas. He commanded the army in the Northern Department until Gates's arrival.
6. Pelissier arrived at Ticonderoga on September 18. See Jeduthan Baldwin, *The Revolutionary Journal of Jeduthan Baldwin, 1775–1778*, p. 76.
7. Donald Barr Chidsey discusses the matter of artificers' pay (*The War in the North*, p. 87).
8. The meaning of *A* has not been determined.
9. Kosciuszko to Gates, May 1777, quoted in Miecislaus Haiman, *Kosciuszko in the American Revolution*, p. 15. Gates was in Philadelphia attempting to resolve a command dispute with Schuyler.
10. Gates to Brig. Gen. John Paterson, 23 May 1777, quoted in *ibid*., p. 16.
11. *Ibid*., p. 18.
12. Quoted in Christopher Ward, *The War of the Revolution*, 1:410.
13. See *The British Invasion From the North: Digby's Journal of the Campaigns of Generals Carleton and Burgoyne from Canada, 1776–1777*, n., p. 204.

Notes to Chapter V

1. Lee to Washington, 5 January 1776, in [Charles Lee], *Lee Papers*, 1:234–35.
2. Washington to Lee, 14 March 1776, in John C. Fitzpatrick, ed., *The Writings of George Washington From the Original Manuscript Sources, 1745–1799*, 4:398.

3. Henry P. Johnston, *The Campaign of 1776 Around New York and Brooklyn*, p. 78.
4. Washington to Lee, 14 March 1776, in Fitzpatrick, *Writings of Washington*, 4:397.
5. Rowena Buell, comp., *The Memoirs of Rufus Putnam and Certain Official Papers and Correspondence*, p. 58.
6. Christopher Ward, *The War of the Revolution*, 1:209.
7. See Erskine to Franklin, 16 August 1776, quoted in John W. Jackson, *The Pennsylvania Navy, 1775–1781: The Defense of the Delaware*, p. 374.
8. Congress authorized the "flying camp" in June 1776 to give Washington a mobile reserve of militia. Mercer's unit was composed of men from Pennsylvania, Delaware, and Maryland. They were active in fortifying New York.
9. Unfortunately this plan has not been found.
10. Cannon known as 24-, 36-, and 48-pounders were the largest in use at the time of the Revolution. The numbers referred to the weight of the cannonballs.
11. Kermorvan's advocacy of Billingsport should be compared with the similar view of Coudray. See chapter 6.
12. Brig. Gen. Frederic William, Baron de Woedtke, was a Prussian officer serving as a general in the Continental Army.
13. Quoted in Ward, *War of the Revolution*, 1:231.
14. Quoted in Johnston, *Campaign of 1776*, p. 74.
15. Washington to the President of Congress, 31 August 1776, in Fitzpatrick, *Writings of Washington*, 5:508.
16. James A. Huston, *The Sinews of War: Army Logistics, 1775–1953*, p. 13.
17. Buell, *Memoirs of Putnam*, p. 60. Putnam explicitly recommended such a move on September 3. Perhaps justifiably, he claimed that land surveys completed by himself and Brig. Gen. Thomas Mifflin between King's Bridge and Morrisania on that day were crucial to the council's decision.
18. Washington, general orders, 20 September 1776, in Fitzpatrick, *Writings of Washington*, 6:79.
19. [David Bushnell], "Bushnell's General Principles and Construction of a Submarine Vessel," pp. 303–12.
20. Quoted in Henry L. Abbot, comp., *The Beginning of Modern Submarine Warfare under Captain-Lieutenant David Bushnell, Sappers and Miners, Army of the Revolution*, p. 5.
21. *Ibid.*
22. Trumbull to Washington, 29 May 1779, in *ibid.*, "Addendum," p. 1.
23. Buell, *Memoirs of Putnam*, p. 64. Putnam's concern for being "hanged for a Spy" was very real. Nathan Hale, a company commander in Knowlton's Rangers who had gathered intelligence of enemy fortifications on Long Island, had been executed the previous month.
24. *Ibid.*, pp. 64–65.
25. William Heath, *Memoirs of Major-General William Heath*, p. 73.
26. *Ibid.*, pp. 73–74.
27. Buell, *Memoirs of Putnam*, p. 65.

28. See diary of Capt. Frederick Mackenzie, in Henry Steele Commager and Richard B. Morris, eds., *The Spirit of 'Seventy-Six*, p. 492.
29. A good description of Fort Washington is in Douglas Southall Freeman, *George Washington*, vol. 4, *Leader of the Revolution*, p. 243.

Notes to Chapter VI

1. John R. Alden, *The American Revolution, 1775–1783*, p. 122.
2. The report was actually submitted on June 21.
3. In February 1777 the Pennsylvania Council of Safety appointed Col. John Bull to oversee the works at Billingsport.
4. Washington to the President of Congress, 9 August 1777, in Worthington C. Ford, "Defences of Philadelphia in 1777," 18:179, 174–75.
5. Coudray to Washington, 10 August 1777, roll 25, Washington Papers, Library of Congress.
6. [Coudray], "Memoir on the Defense of the Two Passages of the River—Billingsport and Fort Island," 30 August 1777, roll 25, Washington Papers.
7. Silvio Bedini, *Thinkers and Tinkers: Early American Men of Science*, pp. 251–52. See also, Douglas Southall Freeman, *George Washington*, vol. 4, *Leader of the Revolution*, p. 485.
8. Washington to Armstrong, 14 September 1777, in John C. Fitzpatrick, ed., *The Writings of George Washington From the Original Manuscript Sources, 1745–1799,* 4:398.
9. Quoted in Freeman, *Leader of the Revolution*, p. 499.
10. John W. Jackson, *The Pennsylvania Navy, 1775–1781: The Defense of the Delaware*, p. 134.
11. *Ibid*., p. 157.
12. John Laurens to Henry Laurens, 14 January 1778, in William Gilmore Simms, ed., *The Army Correspondence of Colonel John Laurens in the Years 1777–8*, pp. 106–07.
13. This reference is to a hospital abandoned by the rebels and taken over by the British.
14. Fleury to Washington, 26 October 1777, roll 45, Washington Papers.
15. These vessels were part of the Pennsylvania navy under Commodore Hazelwood. Fleury, as did other Army officers, criticized the navy's performance on several occasions during the siege.
16. Washington to Smith, 4 November 1777, in Fitzpatrick, *Writings of Washington*, 10:8.
17. The British frigate *Augusta* ran aground on October 21, caught fire, and blew up as a result of shelling by the Americans.

18. Because of illness, Arendt frequently left Smith in command.
19. In November Washington placed Brig. Gen. James Varnum in command of Forts Mifflin and Mercer.
20. Fleury wanted to make conditions known clearly to Washington so he would not be thought guilty "in case of bad event" (Fleury to Washington, 12 November 1777, roll 45, Washington Papers).
21. For the opinions of others, see Ford, "Defences in Philadelphia," 20:95–103, 105–15. Duportail's opinion also is reprinted, pp. 103–05. ,
22. John Laurens to Henry Laurens, 26 November 1777, quoted in Elizabeth S. Kite, *Brigadier-General Louis Lebègue Duportail*, p. 39.
23. For the opinions of others, see Ford, "Defences in Philadelphia," 20:228–47.
24. For additional opinions, see *ibid.*, 20:520–51 and 21:51–71.
25. Christopher Ward, *The War of the Revolution*, 1:383.
26. Kite, *Duportail*, p. 53.
27. Henry Laurens to a friend, 7 April 1778, quoted in *ibid.*
28. See John F. Reed, *Valley Forge: Crucible of Victory*, pp. 19–20.
29. Duportail to Washington, 13 April 1778, quoted in Kite, *Duportail*, pp. 54–55.
30. Quoted in Troyer Steele Anderson, *The Command of the Howe Brothers During the American Revolution*, p. 300.
31. See also Fleury to John Laurens, 7 April 1778, roll 46, Washington Papers.
32. See also "Instructions to Duportail," 30 June 1778, in Fitzpatrick, *Writings of Washington*, 12:134–35.
33. Board of War to Joseph Reed, 8 March 1779, in *Pennsylvania Archives* 7 (1853):228.
34. Reed to Board of War, 8 March 1779, in *ibid.*, 229.

Notes to Chapter VII

1. Actually Romans had originally projected a blockhouse and a small battery for West Point.
2. Dave Richard Palmer, *The River and the Rock: The History of Fortress West Point, 1775–1783*, p. 131.
3. Hugh Hastings, ed., *The Public Papers of George Clinton*, 2:712.
4. Israel Putnam to Washington, quoted in Elizabeth S. Kite, *Brigadier-General Louis Lebègue Duportail*, p. 85.
5. The reference is probably to James Lovell, a member of the Committee on Foreign Applications, who understood French and had many contacts with French volunteers in the Continental Army.
6. Kite, *Duportail*, p. 89.
7. Gates to Putnam, 5 March 1778, quoted in Palmer, *The River and the Rock*, p. 145.
8. Kite, *Duportail*, p. 92.
9. McDougall to Washington, 13 April 1778, quoted in *ibid.*, p. 94.

10. Miecislaus Haiman, *Kosciuszko in the American Revolution*, pp. 51–52.
11. Washington to Sullivan, 19 August 1778, quoted in Kite, *Duportail*, p. 95.
12. Haiman, *Kosciuszko*, p. 51.
13. Quoted in Palmer, *The River and the Rock*, pp. 169–70.
14. Washington to Duportail, 19 September 1778, in John C. Fitzpatrick, ed., *The Writings of George Washington From the Original Manuscript Sources, 1745–1799*, 12:469.
15. Thomas Froncek, "Kosciusko," p. 8.
16. Duportail made several letter references to positions in this document suggesting that a map originally accompanied this report. The map has not been found.
17. Robinson's Landing was located on the east bank of the Hudson near Beverly Robinson's house. The house was used frequently as headquarters by commanders in the Highlands.
18. One toise equaled about six feet.
19. Dave Richard Palmer, "Fortress West Point: 19th Century Concept in an 18th Century War," p. 174.
20. Joseph Plumb Martin, *Private Yankee Doodle*, p. 164. Martin, who later became a member of the sappers and miners, served on fatigue duty under Gouvion.
21. Kosciuszko to Col. Richard K. Meade, 23 March 1780, quoted in Haiman, *Kosciuszko*, p. 86.
22. Villefranche to Franks, 19 August 1780, roll 69, Washington Papers.
23. Martin, *Private Yankee Doodle*, p. 262.
24. *Ibid.*, p. 273. In July 1777 Congress organized the Corps of Invalids with Colonel Lewis Nicola as commander. The Corps was supposed to serve as a military school for young men, but evidence shows that it never fulfilled that role and performed largely as a guard unit.

Notes to Chapter VIII

1. Lee to Washington, 10 May 1776, in [Charles Lee], *Lee Papers*, 2:18.
2. Lee to Richard Henry Lee, 12 April 1776, in *ibid.*, 1:416–17; Lee to Edmund Pendleton, 9 May 1776, in *ibid.*, 2:15–16.
3. Lee to Washington, 10 May 1776, in *ibid.*, p. 18.
4. Lee to John Hancock, 21 March 1776, in *ibid.*, 1:360.
5. Lee to Washington, 10 May 1776, in *ibid.*, 2:18. By August 2 both Massenbach and Stadler had left the Continental service. See document 1, chapter 1.
6. Charles Lee, general orders, 19 June 1776, in *ibid.*, p. 74. John Richard Alden states that South Carolinians found the necessary physical labor distasteful and had Negro slaves do most of the work (*General Charles Lee. Traitor or Patriot?*, p. 121).
7. Lee to Rutledge, 25 June 1776, in *Lee Papers*, 2:83.

8. Charles Lee, general orders, 24 June 1776, in *ibid.*, pp. 81–82.
9. Lee to Moultrie, 21 June 1776, in *ibid.*, pp. 78–79. De Brahm later joined the Continental Army as an engineer officer.
10. The reference is to John Rutledge, president of the South Carolina General Assembly.
11. Henry Steele Commager and Richard B. Morris, eds., *The Spirit of 'Seventy-Six*, p. 1067.
12. *Ibid.*, p. 1066.
13. The commodore was Sir Peter Parker.
14. Lee to Washington, 1 July 1776, in *Lee Papers*, 2:101.
15. Lee to Rutledge, 1 July 1776, in *ibid.*, p. 105.
16. Lee to John Armstrong, 27 August 1776, in *ibid.*, p. 246.
17. Lee to Armstrong, 15 August 1776, in *ibid.*, p. 231.
18. *Ibid.*, p. 230.
19. Lee to the Board of War and Ordnance, 27 August 1776, in *ibid.*, p. 245.
20. Senf's name also appears in contemporary documents as "Senff."
21. Benson J. Lossing, *The Pictorial Field-Book of the Revolution*, 2:553.
22. Lincoln to Moultrie, 20 June 1779, in William Moultrie, *Memoirs of the American Revolution, So Far As It Related to the States of North and South Carolina, and Georgia*, 1:491–92.
23. As was customary in French overseas operations, d'Estaing was both vice-admiral and lieutenant-general. In 1778 he was given command of the "Armées de Terre et de Mer."
24. In the mid-1760s Jean Baptiste de Gribeauval, famed French general, reorganized the French artillery. Gribeauval stressed mobile guns with improved range and accuracy. See Robert S. Quimby, *The Background of Napoleonic Warfare. The Theory of Military Tactics in Eighteenth Century France*, pp. 146–47. D'Estaing may have been referring to Duportail's regulations for the Royal Engineers [1776]. The exact source for Gribeauval's criticism is unclear.
25. A flute was a warship converted to a partially armed naval transport by dismounting the main guns.
26. Penelope was the faithful wife of Odysseus in Greek mythology. When besieged by suitors in her husband's absence, she promised to make a decision among them only after weaving a shroud. To postpone the decision, each night she unraveled the preceding day's work.
27. After the successful defense of Sullivan's Island in 1776, South Carolinians renamed the island's fort in honor of William Moultrie.
28. Other sources give the date as February 11.
29. Moultrie, *Memoirs*, 2:80, gives the date as April 26.
30. Six engineers had been captured at Charleston the previous year.
31. Miecislaus Haiman, *Kosciuszko in the American Revolution*, p. 122.
32. *Ibid.*, p. 109.
33. *Ibid.*, pp. 109–10.
34. Quoted in Don Higginbotham, *The War of American Independence. Military Attitudes, Policies, and Practices, 1763–1789*, p. 372.
35. Col. Thomas Brown was the British commander at Fort Cornwallis.
36. Matrosses were privates in artillery units.

37. Although wounded, Kosciuszko was back at work the following day on a subterranean gallery adjacent to the mine.
38. The rebel trench was only seventy yards from the abatis.
39. Lt. Col. John Cruger, commander of the British garrison at Ninety-Six, belonged to a prominent New York family. He commanded one of the Loyalist battalions organized by Oliver De Lancey.
40. Lt. Col. Francis Hastings-Rawdon commanded a provincial regiment comprised largely of the volunteers of Ireland. Later he served under Cornwallis at Yorktown.
41. Earlier Rawdon had lost Camden and urged Cruger to abandon Ninety-Six, but Cruger never received the communication.
42. On June 7 Rawdon left Charleston to relieve Ninety-Six.
43. Quoted in Thomas Froncek, "Kosciusko," p. 78.

Notes to Chapter IX

1. Admiral Marriot Arbuthnot was noted for his unwillingness to cooperate with General Clinton and for his lack of aggressiveness in battle.
2. George Sackville, Lord Germain, was the British Secretary of State for the American colonies during 1775–82.
3. Joseph Plumb Martin, *Private Yankee Doodle*, p. 219.
4. Elizabeth S. Kite, *Brigadier-General Louis Lebègue Duportail*, p. 202.
5. Duportail to Washington, 15 August 1781, in *ibid*.
6. Martin, *Private Yankee Doodle*, pp. 222–23. Washington's whole army was paid in specie supplied by the French.
7. De Grasse to Washington, 15 August 1781, in Kite, *Duportail*, p. 206.
8. *Ibid*.
9. Admiral Jacques-Melchior Saint-Laurent, Comte de Barras, commanded the French fleet at Newport when the Yorktown campaign opened. He was slow to cooperate with Washington and Rochambeau. On September 10, de Barras finally entered Yorktown harbor in support of Rochambeau.
10. "Of line" refers to ships, usually mounting 74 or more guns, capable of taking a position in the line of battle.
11. Washington to Gouvion, 2 September 1781, in Kite, *Duportail*, p. 205.
12. Although commissioned as a captain in the Corps of Engineers on 16 April 1778, Capitaine had never served with the engineers but rather had served as Lafayette's aide-de-camp. He did not consider himself among the engineers at Yorktown.
13. A surtout is a man's close-fitting overcoat or frock coat.
14. By eighteenth century military custom, being entitled to quarters meant having one's life spared and receiving good treatment upon surrender. Thus the sappers and miners, being "allowed no quarters," were subject to execution.

15. James Gilliland, David Bushnell, and David Kirkpatrick each commanded a company of sappers and miners. It is unclear which commander Martin was referring to here.
16. The reference is probably to David Kirkpatrick, who was wounded at Yorktown but held rank of captain at the time.
17. Quoted in Mark Mayo Boatner, *Encyclopedia of the American Revolution*, p. 1245.
18. James Thacher, *A Military Journal During the Revolutionary War, From 1775 to 1783*, p. 343.
19. Martin, *Private Yankee Doodle*, pp. 240–41.
20. Duportail to Washington, 29 October 1781, in Kite, *Duportail*, p. 219.
21. Washington to the President of Congress, 31 October 1781, in *ibid*., p. 220.
22. Washington to Gouvion, 31 October 1781, in John C. Fitzpatrick, ed., *The Writings of George Washington From the Original Manuscript Sources, 1745–1799*, 23:314.
23. Washington to Duportail, 26 October 1781, in Kite, *Duportail*, p. 215.

Notes to Chapter X

1. Richard H. Kohn, *Eagle and Sword: The Federalists and the Creation of the Military Establishment in America, 1783–1802*, p. 44.
2. Washington to the President of Congress, 7 June 1783, in John C. Fitzpatrick, ed., *The Writings of George Washington From the Original Manuscript Sources, 1745–1799*, 26:479–80.
3. Duportail to Washington, 25 May 1783, in Elizabeth S. Kite, *Brigadier-General Louis Lebègue Duportail*, pp. 259–60.
4. Washington to the President of Congress, 7 June 1783, in Fitzpatrick, *Writings of Washington*, 26:479.
5. *Ibid*.
6. As the only remaining British naval base in North America, Halifax, Nova Scotia, was an important consideration in postwar American planning.
7. "The wicked Corrispondence" and the "revolt of the Virmonteres" refer to attempts by the Allen brothers to align Vermont with the British.
8. Clinton to Washington, 17 April 1783, in Jared Sparks, ed., *Correspondence of the American Revolution*, 4:30.
9. "Three-years-men" were men whose enlistments were expected to continue after the end of the war, as opposed to men enlisted "for the duration" who were to be discharged at the conclusion of peace negotiations.
10. Washington to Lt. Col. William Stephens Smith, 21 April 1783, in Fitzpatrick, *Writings of Washington*, 26:345.
11. Don Higginbotham, *The War of American Independence. Military Attitudes, Policies, and Practices, 1763–1789*, p. 441.
12. Washington, "Sentiments on a Peace Establishment," 2 May 1783, in Fitzpatrick, *Writings of Washington*, 26:381–82.

13. Washington to Duportail, 23 April 1783, in Kite, *Duportail*, p. 257.
14. The 45th parallel marked the boundary of the United States and Quebec Province.
15. Duportail informed Washington that if Congress truly wanted to it could get his continued services or those of Gouvion and Laumoy by reapplying to the French government. This statement indicated some willingness to stay, but he rightly felt Congress would have to make the first move.
16. Duportail to Washington, 30 September 1783, in Kite, *Duportail*, p. 264.

Glossary

ABATIS. Obstacles having the effect of barbed wire, formed by cutting down trees, sharpening and entangling the branches, and turning them toward the enemy.

ARTIFICER. A soldier or civilian mechanic who performed skilled labor with troops in the field.

BANQUETTE. A step on the inside of the parapet for troops to stand on when firing.

BARBETTE. A raised platform enabling guns to fire over a parapet without an opening being cut for them. Guns set in this position are *en barbette*.

BASTION. The part of a fortification that projects at an angle toward the field, enabling defenders to sweep their fire along the face of the main wall.

BATTERY. A fortification mounted with artillery.

BERM. A narrow ledge between the ditch and the parapet which serves as a passageway and also prevents earth from rolling into the ditch.

BLIND. A screen made of branches for concealing troops.

BREACH. An opening made anywhere in a fortification by the besiegers prior to a direct assault.

BREASTWORK. A defensive work hastily constructed above ground, usually breast high, to protect defenders while standing.

CARCASS. An incendiary projectile.

CASEMATE. A bombproof structure.

CHAIN (surveying). A chain with standardized links used in measuring distances on the ground.

CHANDELIER. A timber frame filled with fascines.

CHEVAL-DE-FRISE. A timber frame inserted with iron-tipped lengths of wood. The marine version was weighted and sunk to the river bottom to obstruct the passage of enemy vessels. Generally used in a series (*chevaux-de-frise*).

CIRCUMVALLATION, LINE OF. An earthen wall and trench placed between the besieging troops and the field to provide protection from an attack by a relieving army.

COUNTERSCARP. The exterior slope of the ditch.

COUNTERVALLATION, LINE OF. An earthen wall and trench placed by the besiegers between themselves and the fortress to provide protection from counterattack.

COVERED (COVERT) WAY. A flat space above the exterior slope of the ditch, usually with its own banquette and wall terminating in a slope toward the field.

CURTAIN. The part of a wall that joins two bastions, towers, or like structures.

DEMI-BASTION. A bastion with one face and one flank.

DEMI-LUNE. *See* ravelin.

DITCH. A large, deep trench surrounding a fortification.

EMBRASURE. An opening at the top of a wall through which cannon may fire.

ENCEINTE. The main wall or "body" of a fortress, including the rampart with its parapet.

ENFILADE. A position exposed to fire along its whole length; to fire along the length of a trench.

EPAULEMENT. A type of breastwork providing cover from flanking fire.

ESCALADE. An attack on a fortified position using ladders.

FASCINE. A bundle of small branches used to fill ditches and strengthen earthworks.

FLANK. The part of a bastion extending from the curtain to the face.

FLECHE. A V-shaped earthwork erected in the field.

FOSSE. A ditch, usually filled with water.

FOUGASS. A small mine.

FRAISE. A defense made of pointed stakes that are generally placed obliquely or horizontally on the outward slope of an earthen rampart.

GABION. A bottomless, cylindrical wicker basket filled with earth and used in field fortifications.

GALLERY. An underground passage connecting the inner and outer works of a fortification; the largest type of mine tunnel.

GLACIS. An earthen bank sloping gradually toward the field from the top of the counterscarp or covered way to help make the attackers visible from the parapet.

HORNWORK. An outwork consisting of two bastions joined by a curtain.

HURDLE. A rectangular wicker construction used to strengthen batteries, aid in crossing shallow water, and protect workmen. *See* gabion.

LUNETTE. A work consisting of a salient angle with two flanks that are open to the rear.

MANTLET. A movable screen placed at the head of a sap for protection.

MERLON. The solid part between two openings in a wall.

PALISADE. A fence-like defense formed of pointed stakes (also known as palisades) set several inches apart in the ground.

PARALLELS. A series of trenches placed in front of and parallel to the face of a fortress to provide cover for the attackers.

PARAPET. An elevation of earth or other material on the main wall.

PERCH. A unit of measure equal to ten feet.

PIONEERS. Troops detailed to clear obstructions placed in the line of march or before enemy fortifications, dig trenches, and construct bridges and roads.

PLANE TABLE. An instrument, used to plot maps, consisting of a wooden panel mounted on a tripod.

RAMPART. The broad earthen wall on the interior side of a ditch surrounding a fortified place.

RAVELIN. A crescent-shaped outwork, usually placed between two bastions, also called a *demi-lune*.

REDAN. A V-shaped work often joined with other works to form a simple fortification.

REDOUBT. An enclosed work used to defend a prominent point in the field.

REENTRANT. An angle projecting into a fortress from the field.

REMBLAI. Material, usually the earth excavated from the ditch, that is used in erecting the rampart and the parapet.

REVETMENT. A masonry covering providing protection for an earthen embankment.

SALIENT. An angle projecting from a fortress into the field.

SAP. A deep, narrow trench forming an approach to a besieged place.

SAPPERS. Engineer troops who dig trenches (saps) and mine galleries. Usually referred to as sappers and miners.

SAUCISSON. A large fascine.

SCANTLING. A small piece of lumber.

SCARP. The inner slope of the ditch.

SLEEPER. The undermost timber of a gun battery.

SOUTERRAIN. An underground passage.

TAIL. The point of a trench where the besiegers first break ground.

TALUS. The slope of the face of a work.

TENAILLES. Low works placed in the ditch in front of the curtain.

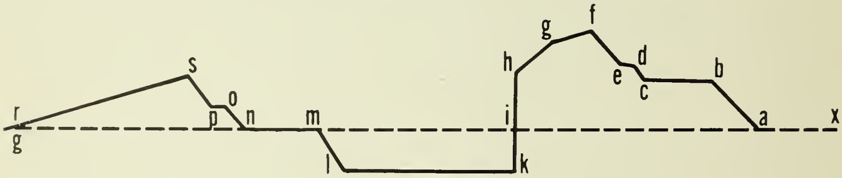
TERREPLAIN. The flat part of the wall on which cannon are placed.

TRACE. The ground plan of a fortification; to make such a plan.

TRAVERSE. An embankment to provide protection from the sweeping fire of the enemy, usually placed across the covered way.

TRIANGULATION. A surveying technique employing triangles to determine distances between points.

ZIG-ZAG. The winding pattern of approach trenches designed to prevent the besiegers from being swept by gunfire.



VERTICAL PROFILE OF A FORTIFICATION. *The mass of earth,* a–h, *forms the rampart with its parapet,* e–g; *a, b is the interior slope of the rampart;* b,c *is the terreplain;* d,e *is the banquette;* g,h *is the exterior slope of the parapet;* h,i *is the revetment;* h,k *is the scarp;* i–m *is the ditch;* l,m *is the counterscarp;* m,n *is the covered way;* n–p *is the covered way banquette; and* r,s *is the glacis.*

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